PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : B65D 81/24

A1

(11) International Publication Number: WO 91/19651

(43) International Publication Date: 26 December 1991 (26.12.91)

(21) International Application Number: PCT/GR91/00008

(22) International Filing Date: 14 June 1991 (14.06.91)

(30) Priority data:
900100446 14 June 1990 (14.06.90) GR

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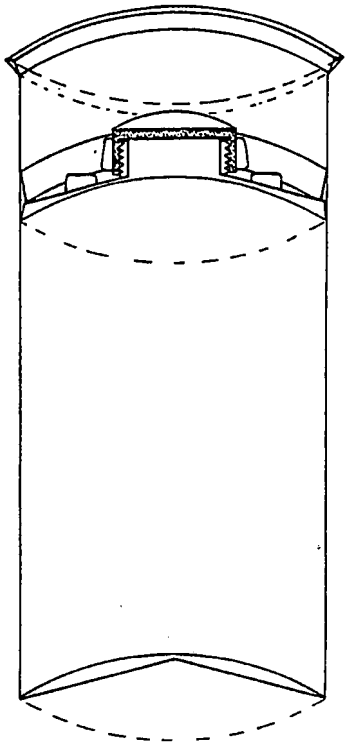
(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: METHOD, MECHANISMS AND MEANS FOR THE PRESERVATION OF FOOD PRODUCTS, CHEMICALS, PAINT, COSMETICS ETC. WITHOUT THE NECESSITY OF PRESERVATIVE USE TO EXTEND SHELF LIVE

(57) Abstract

From a technical point of view, this invention belongs to the field of packaging, preservation and transportation goods. It solves the problem of the almost non-existent protection of the contents of a container or a package, after the latter has been opened and a part of the contents removed; this protection is achieved by removing the air and gases which spoil the contents. It consists of 3 main parts: The first part is the main 'container/utensil': It preserves the contents by keeping out the air that spoils it. This is achieved by adapting the form of the container/utensil to the volume of the contents each time. The second part consists of simple constructions of 'bags/flexible containers' and partitions which are combined with our containers/utensils or with any other already existing containers, providing the same result. The third part consists of 'plugs/valves' and 'valves/containers' which assure either the preservation or the safe ripening of the contents inside the main container/utensil. Further, our invention proposes methods of a more reasonable, safe and less-polluting construction of containers/utensils, as well as ways to transport and distribute them.



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METHOD, MECHANISMS AND MEANS FOR THE PRESERVATION OF FOOD PRODUCTS, CHEMICALS, PAINT, COSMETICS ETC. WITHOUT THE NECESSITY OF PRESERVATIVE USE TO EXTEND SHELF LIVE

"Method, mechanisms and means which assist the conservation, preservation, transportation and consumption of sensitive foodstuffs and other products, with or without preservatives."

This invention is useful to all the sectors which deal with sensitive products, whether or not they are foodstuffs. It concerns non-processed products and products that have already had a preliminary technical processing protecting them against spoilage, as well.

Methods used so far were mainly based on chemistry, refrigeration and, to a lesser extent, on the preservation of the product by air-lock. This latter was achieved by means of special machinery and was lost the moment the consumer opened the package for the first time.

This new method now is promising an easier as well as a repetable air-tight packaging with a permanent air-lock, that the consumer can create himself. In this way, the packaged product always remains safe against the harmful effect of air and gases created by the product itself (figure 1 page 1).

Every farmer can put his products into similar 'containers/utensils ' after a short preliminary processing (cleaning, rinsing or instant boiling), without having to preserve them by chemical means, or refrigerate them. He can also keep in his possession the preserved product in order to dispose of it at a later period when it will not be available.
Obviously, the product which is preserved in this way, will not be damaged and therefore, the surplus will not be sold at a lower price.

The product is placed into containers/utensils (fig. 1, p. 1) with or without valves (fig. 1, p. 4). The farmer needs only supervise.

Dairy products (milk, yogurt, cheese, etc.) are particularly threatened by spoilage, even if they are refrigerated.

Using the new packaging proposed here (fig. 1, p. 1),they can be preserved for a much longer time as they do not come into contact with air.

Olive-oil producers do not have to preserve their olives in olive-oil, vinegar or brine. They can preserve them for years, only in water or sligthly salted water, using these containers (fig. 1, p. 1), or in containers with valves fig. 1, 4, p. 4).

Wine-producers and wine-dealers can preserve wine without any preservatives, avoiding in this way the loss they have from the wine-residue.
Using these containers/utensils (figs p. 13), these valves (fig. 2, 5, p. 13), or this diaphragm (fig. 6-11, p. 12), wine does not turn to vinegar, no matter how long it is kept in a barel or in any other container.

Processed and canned products (jams, stewed fruits, tomatopurées, prepared salates, etc.) have to be consumed as soon as they have been opened, or they have to be put into other containers and refrigerated; this solution however is only temporal. The containers proposed here can keep now the contents unspoiled, no matter how many times we remove part of it. (fig. 1, p. 1).

Fruit juices are spoiled if they are kept opened in the refrigerator for a few days. But using these containers/utensils (figs p. 14), air is removed after each use.

Carbonated drinks and refreshments lose their quality once their lid is removed. Now, they can be preserved in air-tight packagings by means of these containers/utensils (fig. 16, 17, 18, p. 14), and, more importantly, always in air-lock.

The proposed containers/utensils can be used also as household utensils , where the consumer can keep his goods (sweets, food, sauses, etc.) and where they will not become mouldy or sugar-coated and will not turn sour or lose their taste.
In addition, these utensils can easily separate the main product from the liquid that surrounds it. (fig. 2, p. 4 and figs

p. 3).

The proposed containers/utensils can even be used for other products, in addition to foodstuffs, which are also spoiled when exposed to air. These containers/utensils (fig. 1, p. 1) protect their contents even when not in use.

OPERATION MODE AND REFERENCE TO FIGURES

1) Figure 1 on page 1 shows a container/utensil with a movable lid which has a plug. The container may be constructed of any material or combination of marerials and may have any form and size.

Its walls are smooth like that of the lid. In this way, the lid slides tightly on the inner walls of the container.

The upper part of the container has a slightly larger diameter, so that the lid can fit in easily.

The lid has rims - or only one - on its perimeter, perpendicular to the lid, in order to obtain a larger adhesive surface and more effective airtightness.

The lid may be flat but would be better with a rising gradient towards the plug, so that the air can be removed more easily from the interior.

The plug may have any form and size, and may lock in any way; Nevertheless, it would be better with a flat and screw-on type, in order to close mormally, without storing up air or pressing the contents out of the container.

When the plug is pulled out, it permits communication between the interior and the air, and thus, permits the movement of the lid. The latter can be pulled and lifted out so that we can remove a part of the contents. Then, we replace the plug and push it down until the rims of the latter reach the surface of the contents. In this way the air comes out through the opening of the plug. Then, we lock the plug and the contents is kept air-locked and airtight. This procedure may be repeated as long as there is some contents remaining in the container, and until the lid reaches the bottom of the latter.

The bottom of the container may be flat but it would better have the same gradient as the lid so that the latter can finally be adjacent to the bottom of the container. In this way, we can also reduce the remaining protected contents (the residue) to a minimum.

Figure 1a on page 1 shows a cross-section of the projections of the plug and the lid. These projections serve to screw and

to unscrew the plug, so that it will not slide in our hand.

The container/utensil and the lid may also be threaded, apart from the smooth walls which slide into one another, so that we can screw the one into the other. They may also have grooves and projections which serve as guides and safety locks at the same time so that the lid will not roll when we unscrew the plug(figs p. 18).

2) The movable lids may also function separately which means they can be used in any other already existing constructions. They can be constructed with or without plugs (fig. 3, 4, p. 3), and with or without safety locks in the container's inner walls (fig. 1a, 1e, p. 5 and fig. 1, 2, 4, p. 17).

3) The plugs may be simple or plugs/valves. Figures 1d and 4c on page 9 show a plug/valve.

A plug/valve like this is composed of: the plug(1d) in which there is a washer (1e) of flexible material (f.i. rubber). According to the side which the washer is inserted into the plug, it becomes either an outlet or an inlet valve (fig. 1e, 1f, 4d, p. 9).

Figure 6a on page 4 is a double plug/outlet valve, which becomes an outlet valve when we screw it from the one side, and a safety plug when we screw it from the other side.

4) Figure 1 on page 19 shows a container/ utensil with an immovable lid and immovable bottom. It is constructed with rims up (d) and down (e) which can be cut either at the factory, in which case it will be an industrial construction, or by the consumer himself when he buys the product. Figure on page 20 shows the same thing. Figure on page 21 shows the same container which is cut into parts.

5) The container/ utensil with a movable bottom or a movable lid - or both parts movable - has some kind of plug (which can be screwed or wedged, etc.) or some kind of valve in its movable parts or in its wall (fig. 1, 2, 3, p. 2).

When the plug is pulled out, air comes in and thus some of the

movable parts can move and can be removed.
The consumer removes a part of the contents or all of it.
If there is some product remaining in the container, the consumer pushes the plug - or some other movable part of the container/ utensil - until it reaches the contents. In this way, as the rims of the plug reach the contents, the air is removed from the interior. Afterwards, the consumer puts the plug on, and the product is always kept airtight. The container/utensil is locked at the same time because of the atmospheric pressure which does not let it open.
The consumer can repeat this procedure every time he removes a part of the contents and as long as there is stil some product remaining in the container/utensil.

The walls of the container/ utensil have the following characteristics:

a) They may be smooth so that the movable parts can slide.

b) they may have notches, used as guides, into which the corresponding projections of the movable parts can be attached so that the latter can slide.
Notches and projections may also be constructed vice versa.

c) There may be a thread on the walls and the movable parts so that the latter can screw, instead of sliding, into the wall.

d) They may be composed of several parts which screw or slide into one another (fig. 5, 9, 10, p. 3).

The bottom of the container/ utensil can be inverted so that the capacity of the container/ utensil will be more effectively adapted to the volume of the reduced contents (fig. 3a, 3b, 3c, p. 2).

6) The container/ utensil with a folding wall (like an accordion) is folding partly or completely, horizontally or vertically (fig. 15, 16, 17, 18, p. 14).
The consumer here removes the plug and the quantity of the contents he wants. Pressing the contents downwards or on the sides, he brings it up to the opening. Then he puts the plug on, and

again creates an airtight package.

One or more safety locks may be placed at the interior or the exterior of a container/ utensil with a folding wall (fig. 16, p. 14 and fig. 15, 17, p. 14).
In this way, the container wall does not return to its initial position when gases created by the contents press it.

There is also the lid with a lapped/folding wall. This lid can fit in the container/utensil's wall and/or in any other already existing container (fig. 7, p. 12).
When it is pushed downwards it removes the air. It can also be adapted, up to a certain point, to the volume of the contents , which is being reduced.

7) The bags/flexible containers which are enclosed themselves in another container (fig. 11, 12, 13, p. 3), empty their contents without allowing air to enter them (fig. 3b, 4b, p. 13). When we press the exterior/protecting container, the bag/flexible container is also pressed and thus, the contents is pushed outwards. When we stop pressing, air does not come in through the outlet orifice, either because we put the plug on, or because there is a non-return valve (fig. 1, 2, 5, p. 13).
But air can enter the protecting container through the opening, or the openings (or a valve) existing in its wall (fig. 11, 13, p. 3 and fig. 4, 5, p. 13).
In this way, the air that comes in presses the bag without communicating with its interior.

The same result can be attained with bags or extensible partitions which are fixed down in the perimeter of the container inner wall. Here, the lips of the bag are immovable while the rest of it can move freely (fig. 13, p. 3, fig. 5, p. 13, fig. 9, p. 14, fig. 15, p. 15).

Also the bottom of the bag may be immovable. In this case, the bottom of the bag,which is in the shape of an inverted cone, is fixed in the bottom of the exterior/protecting container. When the bottom of the container (fig. 11, p. 14) or the perpetual screw which is attached to the bag (fig. 11a, p. 14),

- rotates, then the bag rotates as well and is rolled up. In this way, the bag pushes the contents towards the container opening. When the contents reaches the opening, we put the plug on.

Bags/flexible containers can fit into any other already existing containers (fig. 1, 5, 6, 7, 8, 9a, 9b, 10, 11b, p. 14). The contents is pushed towards the rims of the container in order to remove the air as we pull the bag/flexible container along on the sides, with the help of some interior or exterior yarn, or tape, or other means (fig. 9a, 9b, 10, 11b, p. 13, fig. 12, p. 3).

8) The floating lid (fig. 6, 8, p. 12) is placed on the surface of the liquid which is contained in the large containers , tanks or barrels. It does not offer absolute airtightness, but it reduces the surface that is exposed to the air, being always on the surface of the liquid as the latter is descending.

For more effective protection, but of a shorter course, we use the lid with lapped/folding walls (fig. 7, p. 12).

9) For absolute protection of the contents that can last until it is completely used up, we use an appropriate bag, formed according to the size and the form of the container (barrel, or tank) each time (fig. 9, 10, 11, p. 12, fig. 3, p.13).

The edge of the bag, which has the same diameter as the container, is tightly pinned down in the interior perimeter of the container at the level of the free surface of the liquid (fig. 9, p. 12) or at the neck of the container (fig. 10, 11, p. 12). The rest of the bag floats on the surface of the liquid, compressed or folded.

As long as the level of the liquid is descending, the bag is unfolded and adapted to the surface of the liquid. When the liquid is all used up, the bag takes the shape of the container, the barrel or the tank. (fig. 11b, p. 12, fig. 3b, p. 13).

10) If the opening of the large container (barrel or tank) has a small diameter and does not easily permit the placing of the construction described above, then we pass the bottom of the

bag through the opening of the container and fill it with water. The water drifts the bag along, taking the form of the container and filling up the space that was empty (fig. 9, 10, 11, p. 12, fig. 3, p. 13). At the same time the water removes the air. When the bag is filled until the lips of the opening, we also push in the rest of the bag up to its end; we have already pinned down the lips of the bag tightly to the lips of the opening.

11) In case we doubt whether the walls of the container (barrel or tank) are not appropriate, we use two bags/flexible containers. We put the first bag into the empty container and fill it up with the contents. Next, we use one of the ways described above in order to protect the contents against the air (fig. 11a, 11b, p. 12).

12) Household utensils for permanent use may function like the container/utensil (fig. 1, p. 1, fig. p. 3).
They may also have a perforated partition so that the main product will remain under the surface of the liquid that encloses it (fig. 2a, p. 4, fig. 6a, 7a, p. 3).

If we invert the container/utensil, the liquid passes through the perforated partition and concentrates at the lower part of the utensil while the solid contens alone remains at the upper part.

13) The valves of this invention can be attached - usually they screw - to the containers/utensils of adjustable capacity, or into any other already existing container.

Their main functions are:

a) to balance air pressure, pressures of gases, and pressures created by the contents.

b) to fill up the vaccuums of the contents.

c) to keep the contents of the container/utensil , and also the auxiliary contents of the valve, well insulated and protected .

Figure 4 on page 4 shows a small container including a curved tube. One edge of the latter comes close to the bottom of

the container and the other (4a) comes out of its bottom in order to be attached to the neck of the movable lid (4b) of the container/utensil. The upper part of the curved tube (4c) comes close to the neck of the container/valve. We screw a plug/valve into the neck (4c) - the valve is at the outlet position- and inverting it, we fill the container/valve with a liquid similar to that of the main container/utensil. Then we place the container/valve at the neck of the movable lid (4d) where it starts automatically functionning. This is because, as gases rise, they push the liquid of the container/valve downwards through the tube, into the container/utensil. In this way, the liquid fills up the created vaccuum.

If gases are still created, they go up and concentrate at the upper part of the container/ valve . But as there is no room in the container/utensil, no more liquid descend down to fill it up. Then gases push open the outlet plug/valve (4c), and exit through it.

Figure 1 on page 5 shows a container/valve which has the same form and function as that in figure 4 on page 4; they differ in this respect: the upper part of the container/valve in figure 1 (p. 5) may be constructed as a movable lid (a).

There is a plug/valve (b) with an oil storage reservoir (c) in the neck of the movable lid.
The plug/valve has the form of an adjustable siphon (1c), with oil in it.
As the upper part of the plug (1d) is unscrewed - and therefore lifted upwards - the siphon becomes less and less deep.
The oil is in the storage reservoir locked and independent of the other parts. It serves as a non-evaporated material so that the plug/valve (1b) will not be destroyed.

The costruction of the container/valve shown in figure 1 on page 6 is based on the same operation mechanism described above.

It consists of the following parts:

A) A plug (1a) with an opening into which a funnel-shaped piece of rubber (1b) is attached.

B) A cylinder (c) with a perforated base and with a diaphragme in the middle of it (e).

When we completely screw the plug into the neck of the movable lid of the container/utensil, then the narrow tip of the piece of rubber (b) stops on the diaphragm (e) and/or at the upper edge of the tube(d) and thus, it insulates the contents of the container/utensil and the contents of the plug/valve as well.

The created gases ascend through the perforated bottom and the tube (c) to the upper part of the plug/valve. In this way they push the liquid - with which we have already filled the plug/valve till point X before screwing it on - downwards into the container/utensil.

The created gases concentrate at the upper part of the plug/valve and when their pressure rises to a certain point, they push the funnel-shaped rubber wall (b).
In this way a passage is created between the rubber wall (b) and the edges of the tube (d), and the gases are released.

The valve on page 7 functions like the one on page 6. They differ in this respect: the mechanism of the valve on page 7 is enclosed in the neck of the movable, or immovable, lid and therefore depends on the size of the neck. On the contrary, we do not have this limitation for the valve on page 6.

In the figure on page 6 we can see the lock meckanism of the movable lid in the wall of the container/utensil.

In the figure on page 8 the plug/valve can be unscrewed and detached without losing any of the contents.
In the case of a flow, the liguid falls round the outlet orifice and does not return into the interior of the plug/valve if a shrinkage and a suction of the contents take place.

Valves described so far - which may sometimes have similar characteristics - have had a space which served as a storage reservoir and through which the exchange of liquid and gases was taking place.

The valve in figure 1 on page 4 has the same operating mode

as the valve in figure 4 on page 4 that we have already described. They differ in this respect: the valve in fig. 1 has a diaphragm (a partition) which separates the auxiliary liquid storage reservoir into two chambers. Here, the lower part of the curved tube (a) does not reach the neck of the movable lid; it comes up only near the middle of the lower chamber of the storage reservoir so that gases can be trapped in there. The upper part of the curved tube (b) reaches the upper chamber of the storage reservoir.

The contents of the container/utensil communicates with the contents of the lower chamber of the storage reservoir through a small direct tube (e), incorporated into a double plug (f), which screws into the neck of the movable lid (d) of our container/utensil.

The valve described above is different in function from the one in figure 4 also in this respect: the valve in figure 1 provides double protection; the created gases pass through the small direct tube (e) and on their way towards the upper area of the lower chamber of the storage reservoir, they push the liquid downwards. The latter descends and replaces the gases in the container/utensil.

After a certain point, when many gases have been created, and when the liquid in the lower chamber of the storage reservoir has been recuced - which means that the liquid level is lower than the lower edge (a) of the curved tube - then gases escape through the curved tube and so they pass into the upper chamber of the storage reservoir.

Here, they push the liquid downwards to the lower chamber of the storage reservoir again replacing the gases.

If gases which exist in the upper chamber of the storage reservoir increase excessively, they escape through the plug/valve (c).

In the same way, there may be more than two chambers.

The valve in figure 1 on page 10 is a valve without a liquid storage reservoir.

It consists of a tube (1a) whose the lower edge is completely

open, while the upper edge has a small opening. It also has small openings on the sides which are covered with a thin, soft piece of rubber in the shape of a belt (1d). These openings with the piece of rubber form a kind of outlet valve.

A smaller tube (1b) recoils tightly within the tube (1a). The lower edge of the former is open, while its upper edge has a small opening. In this opening another small tube (1b´) with openings is attached. The openings of the latter are also covered with a belt-shaped piece of rubber (1f) which serves to let air - but not the gases - enter tube 1b through the small tube 1b´.

The tube 1b can be constructed with notches in the perimeter of its wall where washers (1f) (metalic, plastic, elastic, etc.) will be attached. These washers provide more effective airtighness and functioning during the recoiling of the tube 1b into the tube 1a.

The valve functions in the following way:

We place tube 1b at the lowest part of tube 1a. Then we place tube 1a into the neck (1e, 1e´)of the container/utensil and lock it using the plug with the opening (1h)
When the gases accumulate pressure, they push the movable tube (1b) upwards. When the latter reaches the upper point, which is the upper edge of tube 1a, then the gases are more compressed. After a certain point, they press the belt-shaped piece of rubber (1d), so that they free the openings. Then gases can escape and thus are removed.

This procedure can be repeated until all the gases are removed.

If and when there has been a shrinkage of the liquid contained in the container/utensil or an absorption of the liquid by the solid contents, then there can be a suction of the gases - but not of the air - which have been stored up in the valve. This suction moves tube 1b along, which now serves as a movable diaphragm.

If the volume of the gases is not enough to balance the pressures and if tube 1b descends to the lowest permissible point,

then the belt-shaped piece of rubber (1c) starts functioning as a valve. The latter is obliged to permit the entrance of air in order to balance the pressures.

If we do not want air but only liquid in the container/utensil during this stage, then, before attaching valve 1a, we insert a liquid storage reservoir (1g) with a movable lid (1e), into which we attach valve 1a. We attach both parts of the mechanism (the storage reservoir and the valve) at the neck of the main container (D).

In this way, instead of the entrance of air during suction, the entire mechanism with the movable lid (1e) is now moving along. Valve 1c is not functioning during this stage, because it is constructed to operate in a suction stronger than the one needed to move the movable lid.

The difference between the figure on page 11 and the one on page 10, is that fig. 1b on page 11 is a container with an opening in its bottom, and not with an open bottom, and also that valve 1c of container 1b is in its neck (1b).

In this way, when we fill container 1b with liquid, before placing it at the lower part of the tube (1a), there is not any air left in the valve.

When gases start to escape from the main container, they go into the movable lid, (which serves as a diaphragm (1b)) pushing the latter upwards and emptying it from its contents.

The rest of the mechanism's functioning is similar to the preceeding one (on page 10).

Figure 5 on page 9 shows a brief and isolated form of the valve in figure 1 on page 10.

Figure 5a is a perforated partition.

Figure 5b is the movable part of the valve in figure 5 but, instead of a belt-shaped piece of rubber, there is a plug/valve.

figure 6 on page 9 is the same as figure 5b on page 9 but the former has rims (6a) so that it can be held at the neck of the

lid; it also has a belt-shaped piece of rubber (6b) in order to let gases out. It is therefore a simplified form of figure 5 on page 9 and of figure 1 on page 10.

Figure 7 on page 9 and figure 1c´ on page 4 are simple forms of an adjustable inlet-outlet valve with counterpoises or adjustable springs which control the start of the functioning.

The valve in figure 8 on page 9 is the same as the one in figure 7 but the former has plugs/valves.

14) The bags and the flexible containers are protected during transportation and distribution in cases or protective housings (fig. 9, 10, p. 15) and in crates/boxes (fig. 1, 2, 3, p. 15) which have the following characteristics:

a) The crates/boxes and the cases, when they are empty and without their partitions (fig. 5, 6, 7 p. 15) can be put into one another (fig. 4)

b)The partitions alone can also be put into a crate (fig. 8).

c) When the crates/boxes are full, they can stand in one another, balancing the weight among the outer walls, the partitions and the cases (fig. 13).

d) Crates/boxes can hold one another with notches which they have in their bottoms (fig. 4a).

15) Our packages (containers/utensils, boxes and even crates) may be constructed from paper reinforced with metalic or plastic fibres or nettings (figures on p. 16) in order to provide better protection than simple paper, and also in order to avoid the pollution resulted from the plastic.

16) The figures on pages 22 and 23 show a container/utensil which can be disassempled. The points marked by dots are points where the resistance is lower and serve to detach and disassemble these parts of the container/utensil.

17) The figure on page 24 shows a container/utensil with a

safety lock in the lid.

18) Figure A on page 25 shows a container/utensil with safety locks at its upper and lower parts.

Figure B on page 25 shows a container/utensil with immovable lid, movable bottom and a safety lock.

19) The figure on page 26 shows a usual , ordinary container but which have a plug on the lid and an opening on the bottom. The opening serves as an entrance for air when the construction is combined with a bag in the interior or an additional movable bottom.

20) Figures A and B on page 27 and figures 1a, 1b, 2a, 2b, 2c, 5 and 5a on page 13 are mechanisms which use bags in order to trap the air and prevent its contact with the contents. These mechanisms may also function inversely: The contents may be protected in the bags.

Figure A on page 27 shows an additional mechanism in the neck of a container. The air enters the bag Z through tube X. The liquid exits opening (E) by means of the valve . In order to prevent the entrance of air as we turn the container in a vertical position, there is a ball-bearing (M) whichs the weight closes the lower entrance. We can also insert here any other valve.

Figure B on page 27 shows a mechanism composed of two separate parts. The first one serves as an entrance for air and the other as an outlet orifice for liquid. They may even function separately.

21) Figures A and B on page 28 show a container/utensil with an immovable lid and a movable bottom. When the bottom moves upwards, it brings along the bag, pushing in this way the contents towards the opening of the container/utensil.

C L A I M S

1) This is a method of packaging/canning which can be done either by the consumer himself at home, or at the factory. This packaging is achieved by means of some mechanisms and means which assure airtightness and air-lock against air and/or gases. The consumer himself can assure the air-lock of the packaging, and he can repeat it as well, as many times as he likes, the product being always kept in the same'container/utensil'.

2) The mechanism which assures the air-lock of the packaging according to claim 1, by means of a container/ utensil (fig.1, p. 1) is based on the following: the diamensions and the capacity of the latter can be adapted each time according to the volume of the reducing contents.

3) The mechanism which assures the air-lock of the packaging by means of a container/utensil , according to claim 2, or by means of any other already existing container is based on the following: The container/utensil or the already existing container contain a 'bag/flexible container.' This mechanism isolates the contents against air either by isolating the air which enters the bag (fig. p. 27), or by isolating the product which is contained in the bag.

4) The mechanism which assures the air-lock of the packaging by means of a container/utensil , according to claim 2, is based on the following: The container/utensil can be transformed into a kind of a 'container/valve' (fig. 1, p. 4, fig.p. 9, 10, 11), which is attached to the main container. The vaccuum which is created in the main container, due to the reduction of the contents, is filled up by the contents of the container/valve.

5) The container/utensil as described in claims 1 and 2 , has the following characteristics:

a) It has a movable lid (fig. 1a, p. 2) or a movable bottom (fig. 1c, p. 2), or both, with rims (fig. 1c, p. 1) or only one, in the perimeter of the lid. The movable parts have one or more

plugs (fig. 1b, p. 1)

b) The movable parts move along the entire length of the container/utensil's wall or in part of it. They slide into the smooth wall or screw into a thread in the inner wall, or they move into notches, used as guides.

c) The containers/utensils may have movable walls which slide or screw into one another (fig. 9, 10, p. 3). They may have lapped/folding walls (fig. 15, 18, p. 14) or lapped/folding movable parts (fig. 6, 7, p. 12) which fold completely or partialy.

d) The movable bottom may be inverted (fig. 2a, 3a, p. 2) or placed as an optional/additive part into the container/ utensil (point a, fig. B, p. 24), or into any other already existing container (point a, fig. 2, p. 4). The movable bottom may be pushed or pulled bringing along the contents towards the opening of the container/utensil.

e) It has safety-locks in the interior, the exterior, the interior wall or in the movable parts (point c, p. 18, point c, p. 24, points c and d, fig A and B, p. 25), in order to assure a more effective immobilisation of the movable parts, and to avoid the expansion of the walls.

f) It may be easy to disassemble at the positions which have a low resistance,by pressure which is exerted on the lid(fig. p. 23); one may also detach several parts of the wall, as the contents is reduced (fig. p. 22). It may even have several chambers or horizontal compartements, each of which may be emptied separately (fig. 14, p. 14)

g) It may be constructed as a single container (fig. p.20) and it may be divided later into more parts, either at the factory or at home, so that we will have more parts (fig. p. 21) .

6) The bags and the flexible containers described in claim 3 are essentially containers of the lightest permissible construction but they are at the same time durable and appropriately formed, according to the exterior/protecting container each time into which they will be attached. These bags may enclose either the contents, or the air that is entering, or they may iso-

late the contents surface, as they are each time adapted to the volume of the contents.

The bags/flexible containers have the following characteristics:

a) They may be placed in any exterior containers/utensils as described in claim 2, or in any other already existing container. They are adapted to the volume of the contents each time , either alone, or in conjunction with the exterior container.

b) When a bag/flexible container is placed into a container/utensil as described in claim 5, the bottom of the container may move, bringing the bag upwards (fig. 28 A, B, p. 28). The bottom of the container may also screw on (or there may be even a perpetual screw) so that the bag which is attached to the bottom will be lapped, pushing the contents upwards (fig. 11, p.14).

c)They may be combined with containers which have one or more openings on their walls; these openings may always be open, or initially closed. The openings permit the entrance of air into the exterior/protecting container; this air is necessary to push the contents out of the bag, where the product is contained, while the latter is kept isolated in the bag.

d) Inversely, the opposite of the preceeding may occur: Air may enter the bag while the contents is kept isolated in the exterior/protecting container.

e) The mechanism of isolating the air by means of a bag/flexible container may be constructed as a single unit (fig. A, p. 27), or as several parts (fig. B, p. 27) and it may be placed either into containers/utensils as described in claim 5, or into any other already existing container.

f) The bag/flexible container may be combined with a lid which is stabilised like in any other already existing container. Neverveless, this lid here may have one or more plugs. The bag may be pinned down on the plug, on the lid, or on the container wall.

g) The bag (or even a second bag which is contained in the first) may be placed: on the surface of the contents and/or in the main container itself. The bag, or the bags, are adapted

to the volume of the contents each time, so that it, or they , happen to assume the shape of the empty container in the end. (fig. 3a, 3b, p. 13).

7) The container/valve as described in claim 4, is like the container/ utensil described in claims 2 and 5, but here it is specially modified. The container/valve described in claim 4 has the following characteristics:

a) It may be placed in the neck of a container/utensil as described in claims 2 and 5, or into any other already existing containers. (point D, fig. 1, p. 5 and p. 11).

b) We may have modified either the capacity of the container/valve, or the quantity of the liquid which is contained in it (fig. p. 10 and p. 11).

c) It may have one, two, or more liquid or gase reservoirs, or both. (fig. 1 and 4, p. 4).

d) It may function as an adjustable working pressure valve, that the consumer himself may adjust, so that it will start functioning just when the pressure of the gases reaches the desirable limit (figs. p.5).

e) It may be constructed in small dimensions, so that it may fit into the neck of the container/ utensil (or into the neck of any other already existing container), in order to function as a container/valve and a plug at the same time. We call this a 'plug/valve' (fig. 4. p. 9).

f) The plug/valve described above may also function without having any liquid or gases reservoir, because it has the following characteristics:

-It becomes either a simple safety plug, or an outlet valve, according to the side from which we screw it on (fig. 6, p. 4).

- It becomes either an outlet valve (position 1e, fig. 1, p.9) or an inlet valve (posit. 1f), according to the side from which we place its interior diaphragm (fig. 1e and 1f p. 9). Also, according to the position of the opening of the diaphragm (fig. 6, p. 4) it may become a safety plug.

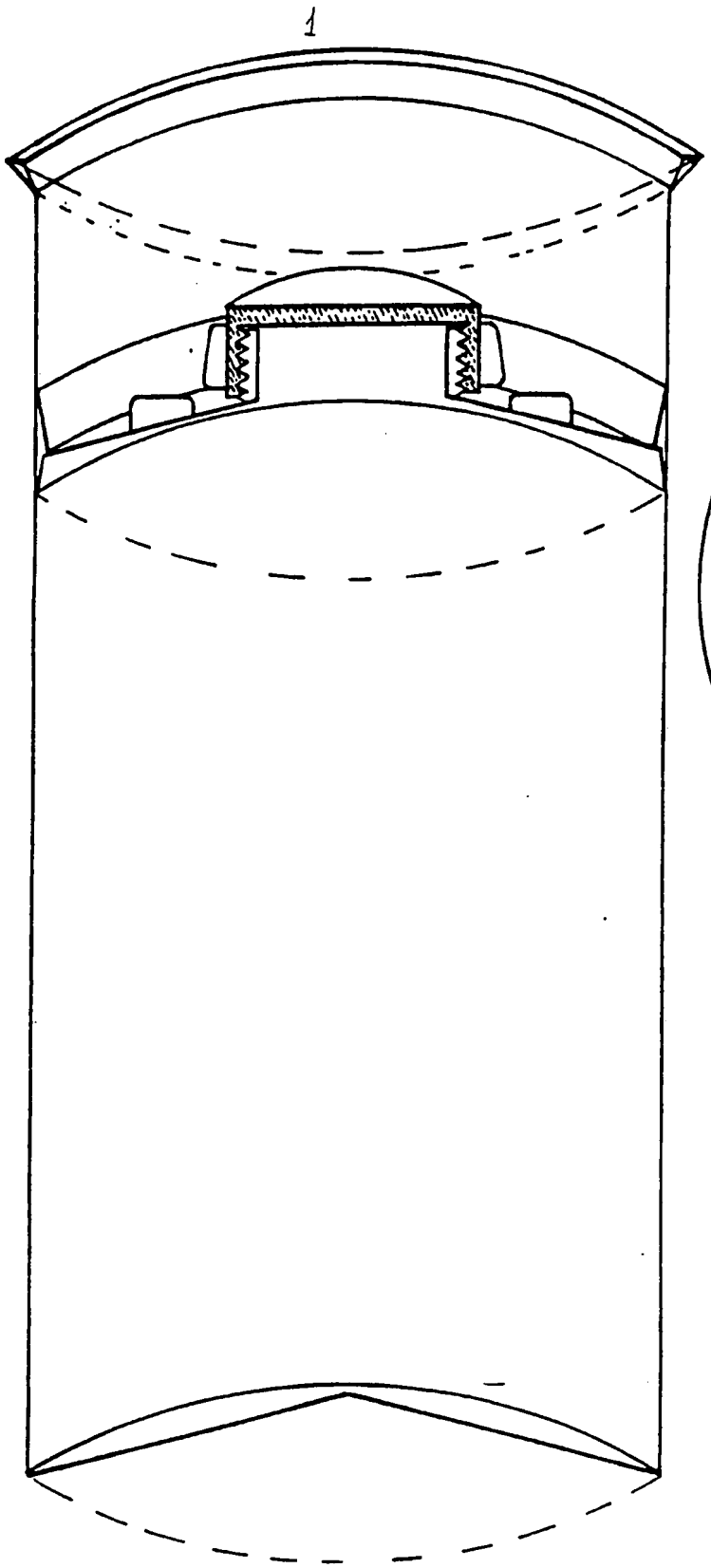
8) Our constructions may be made in several sizes and of

several meterials (plastic, metal, glass, paper, etc.), and of combinated materials as well, f.i.:

a) The movable lid of the container/utensil (fig. 1a, p. 2) may be made of glass while the rims in its perimeter (fig. 1c, p. 1) may be made of plastic or elastic material.

b) The container/utensil may also be constructed of one or more paper sheets: between and among the latter, fibres or nettings - made of a durable material (metal, plastic, etc.)- may be inserted.

c) Our more fragile constructions (f.i.: bags and containers/utensils made of paper) may be transported in 'crates/cases'(fig. 1-3, p. 15). The upper part of a crate/case has a larger diameter than the bottom of it, so that they can be put into one another when their movable and crossing partitions (fig. 5-7, p. 15) have been removed. The bottom of the crate/case has notches (fig. 13, p. 15) so that they can hold one another when they are full (fig. 12, p. 15).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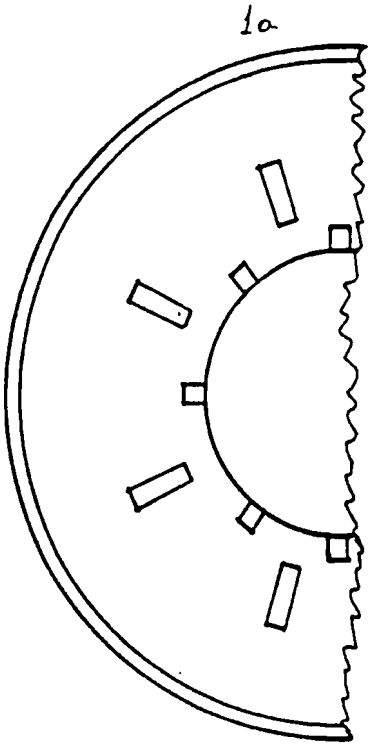
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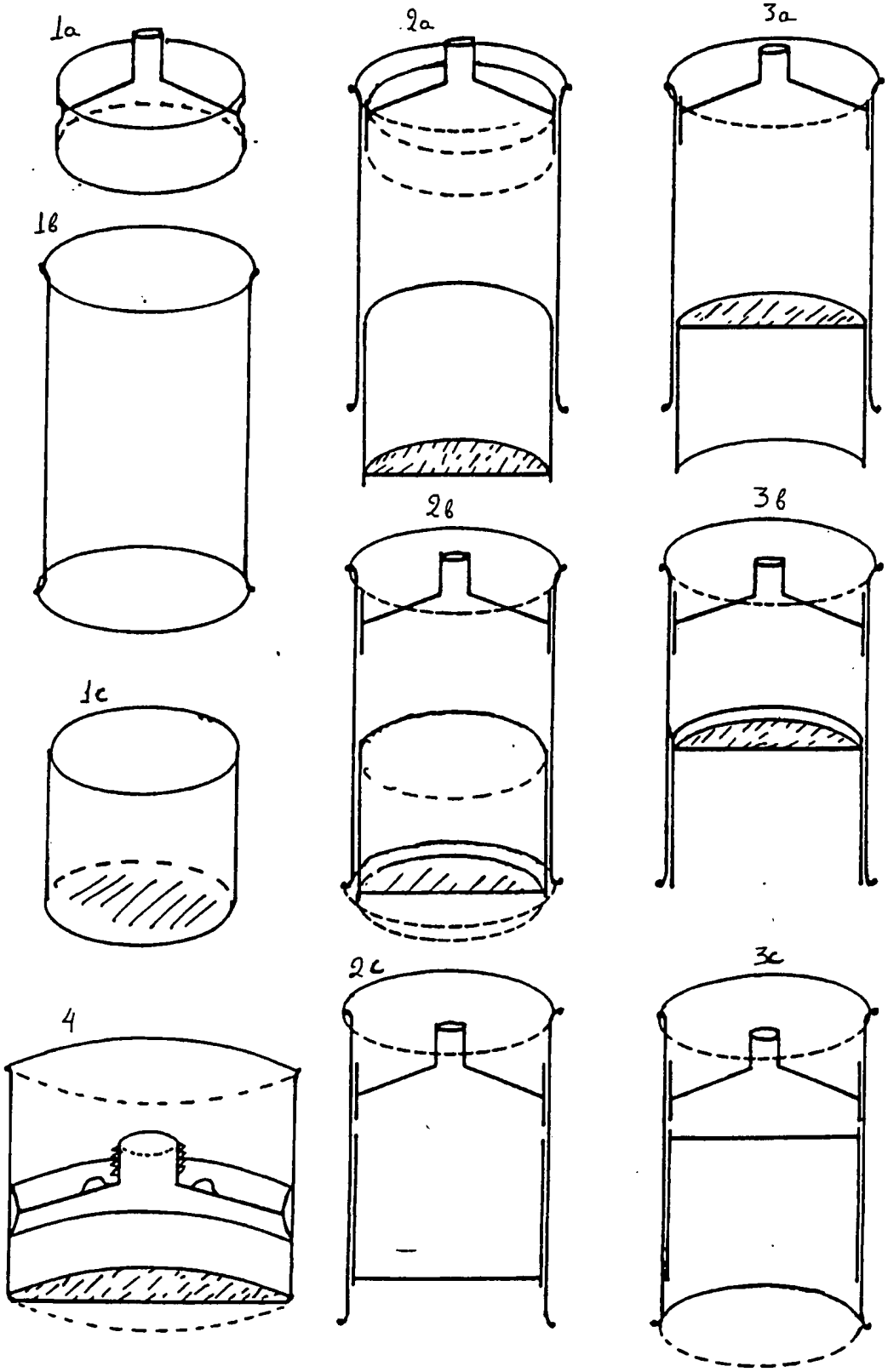

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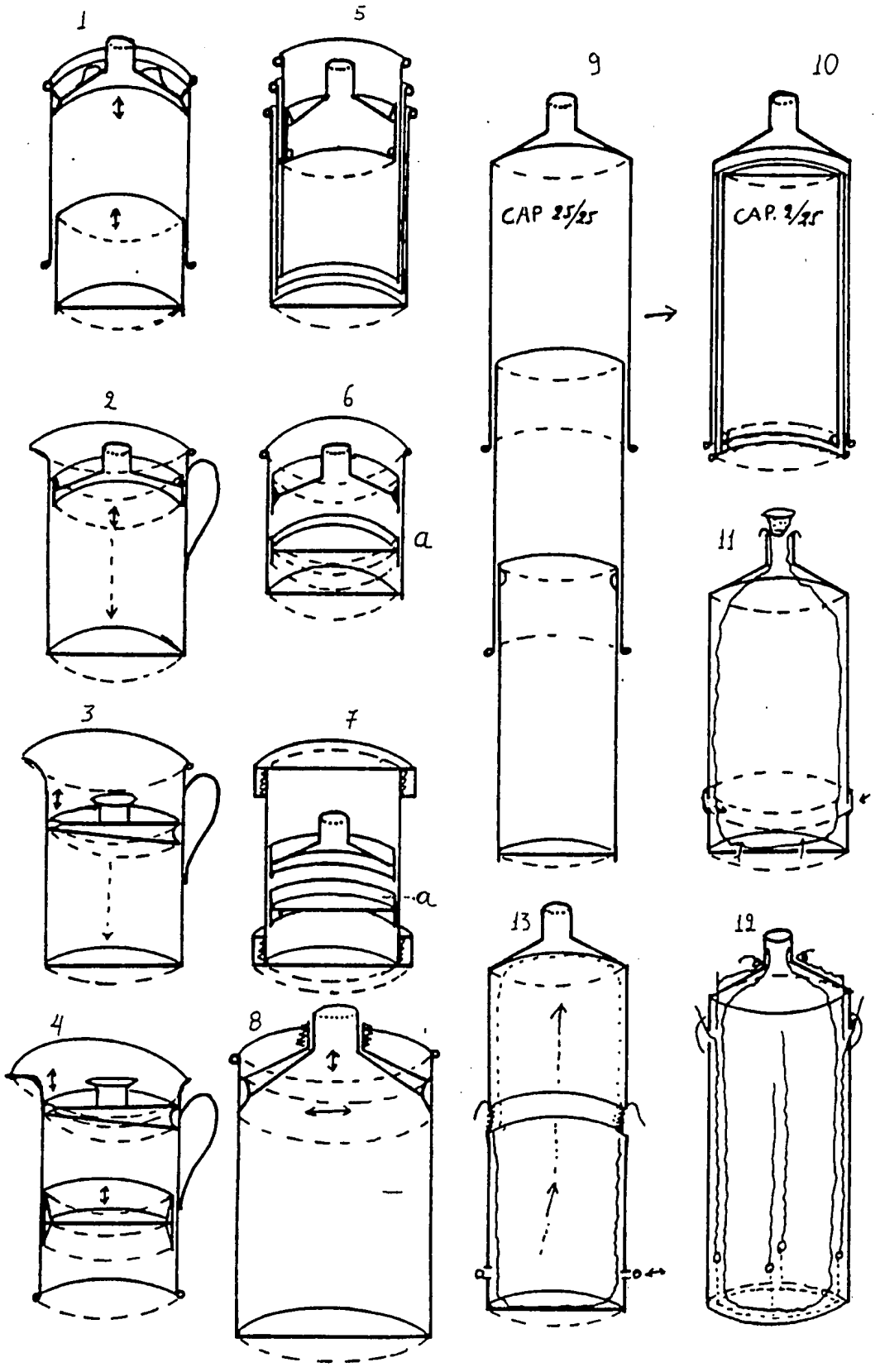

FIGURES

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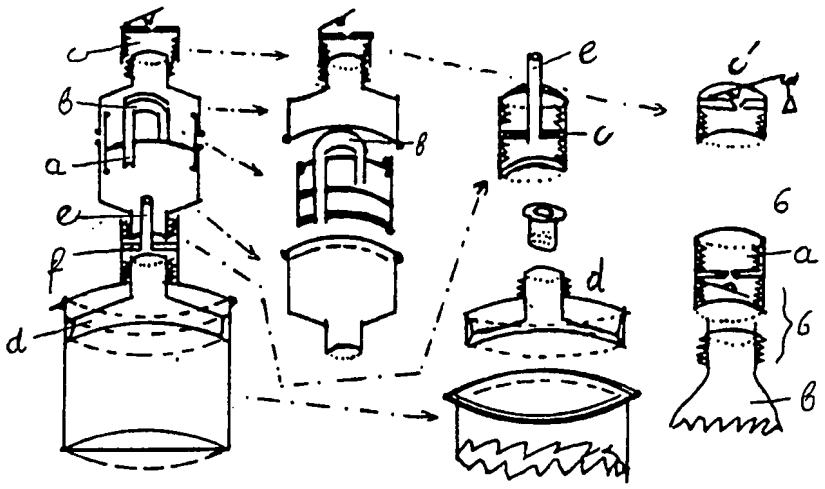

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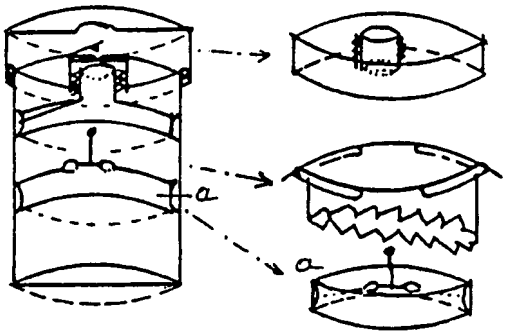

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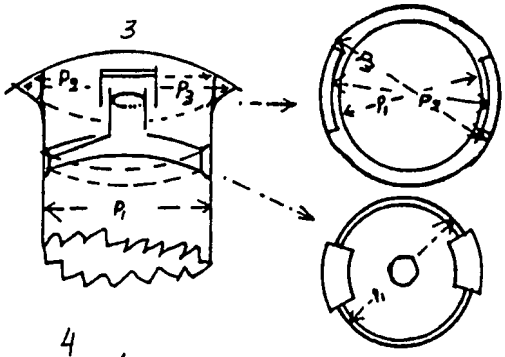

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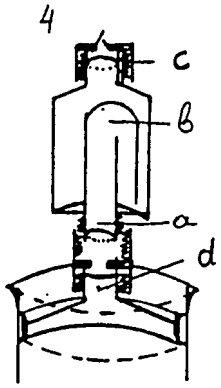

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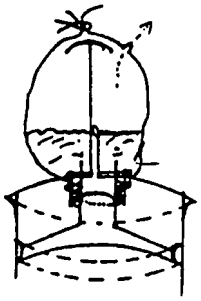

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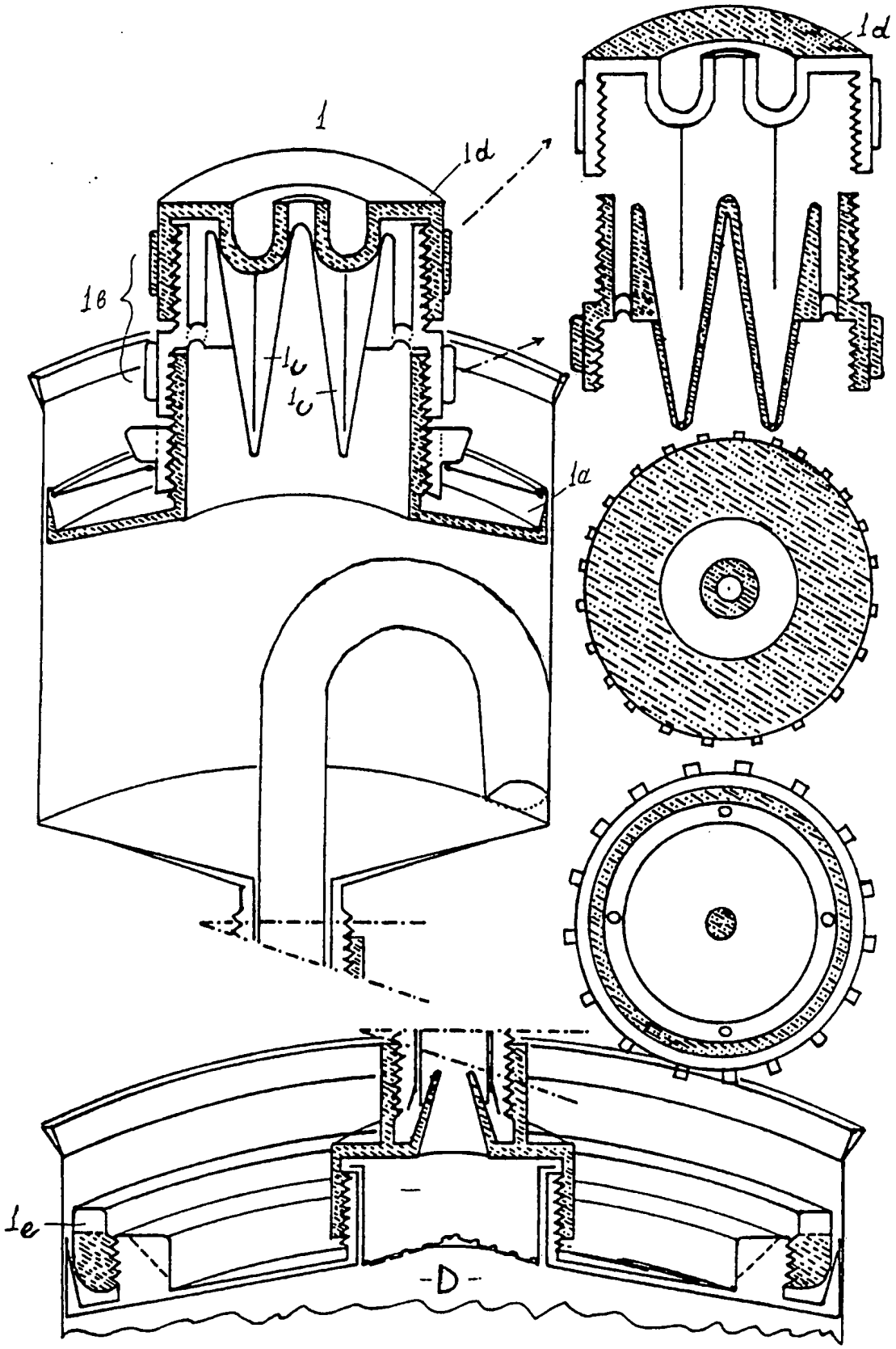

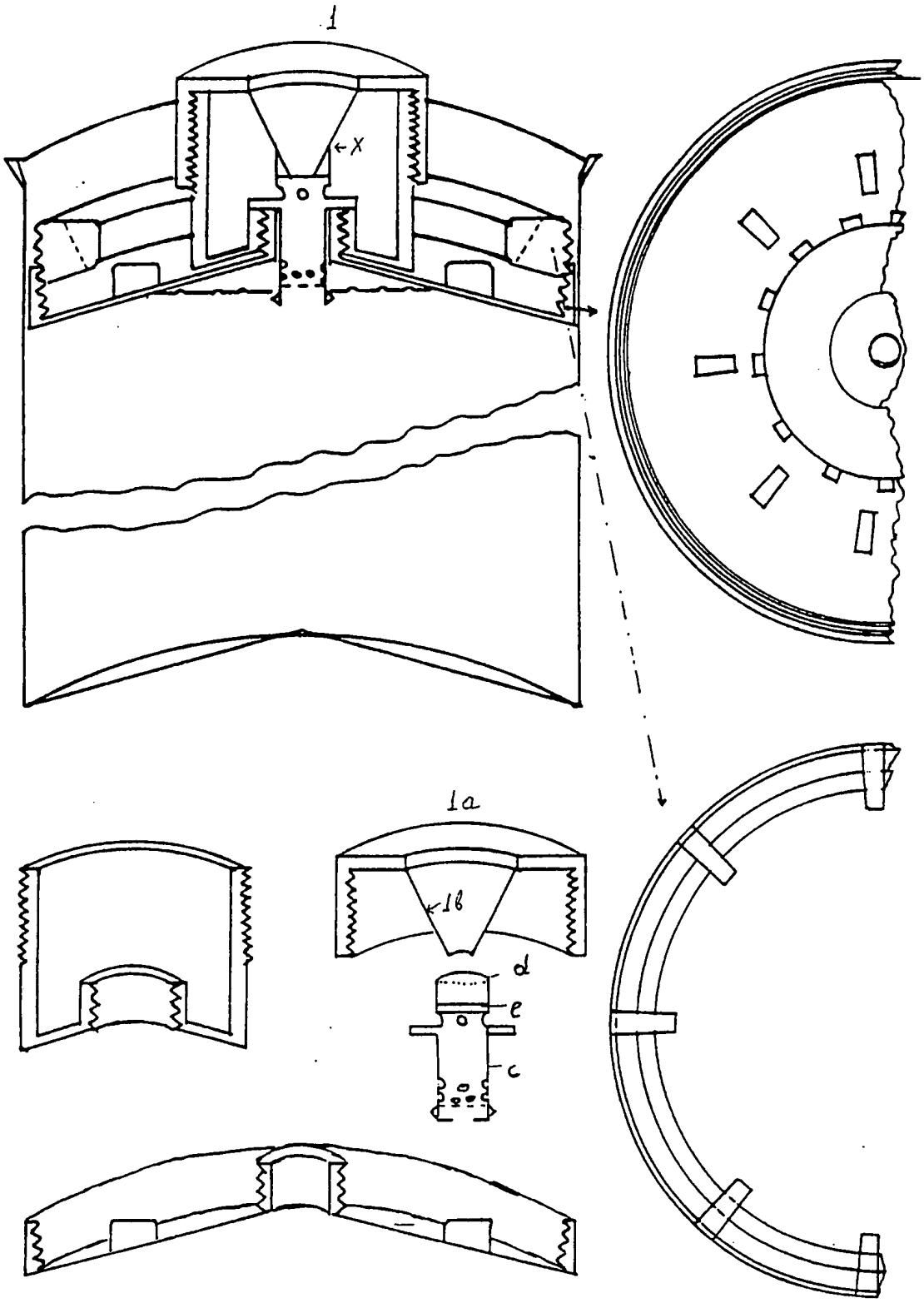
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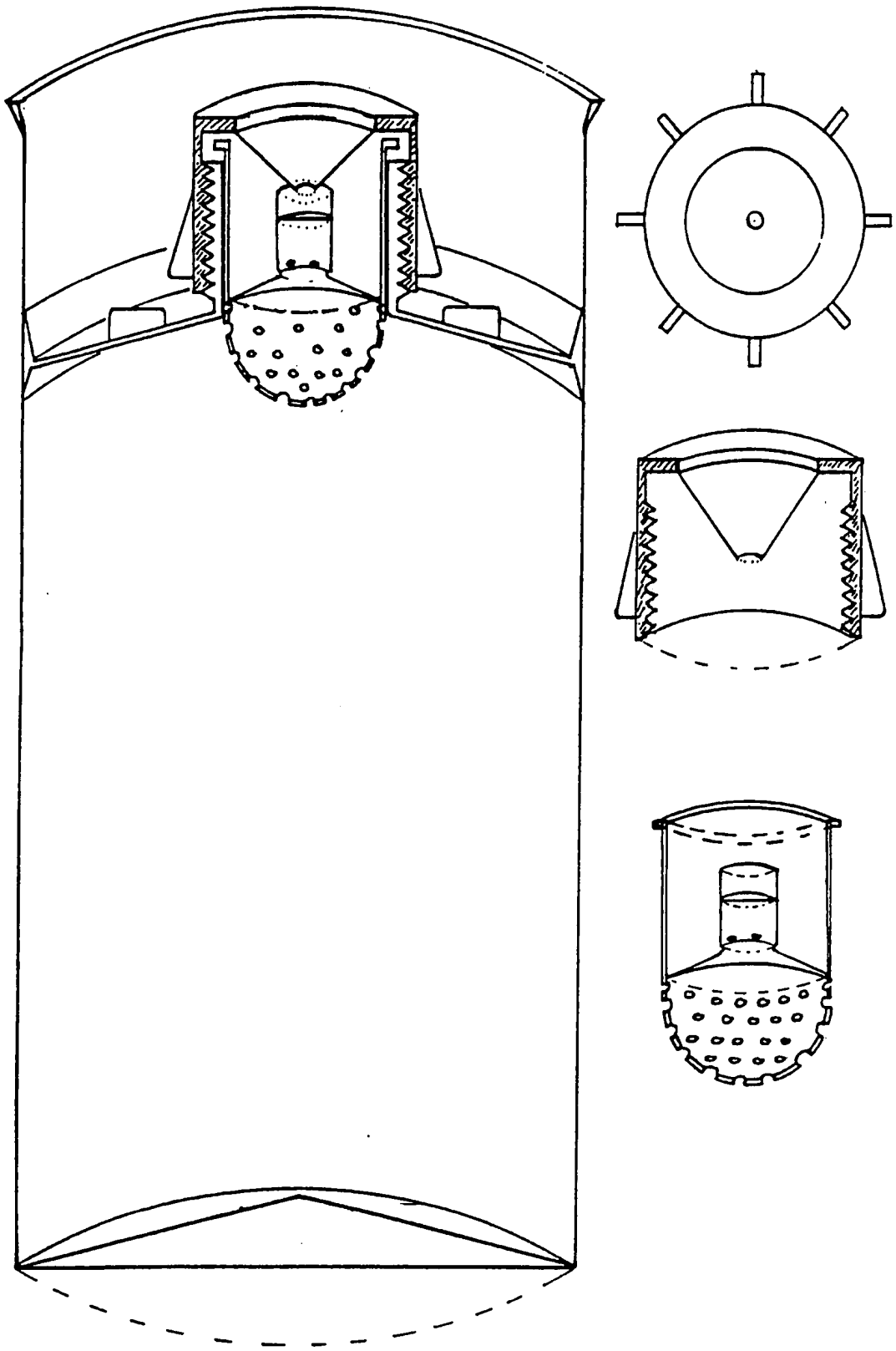

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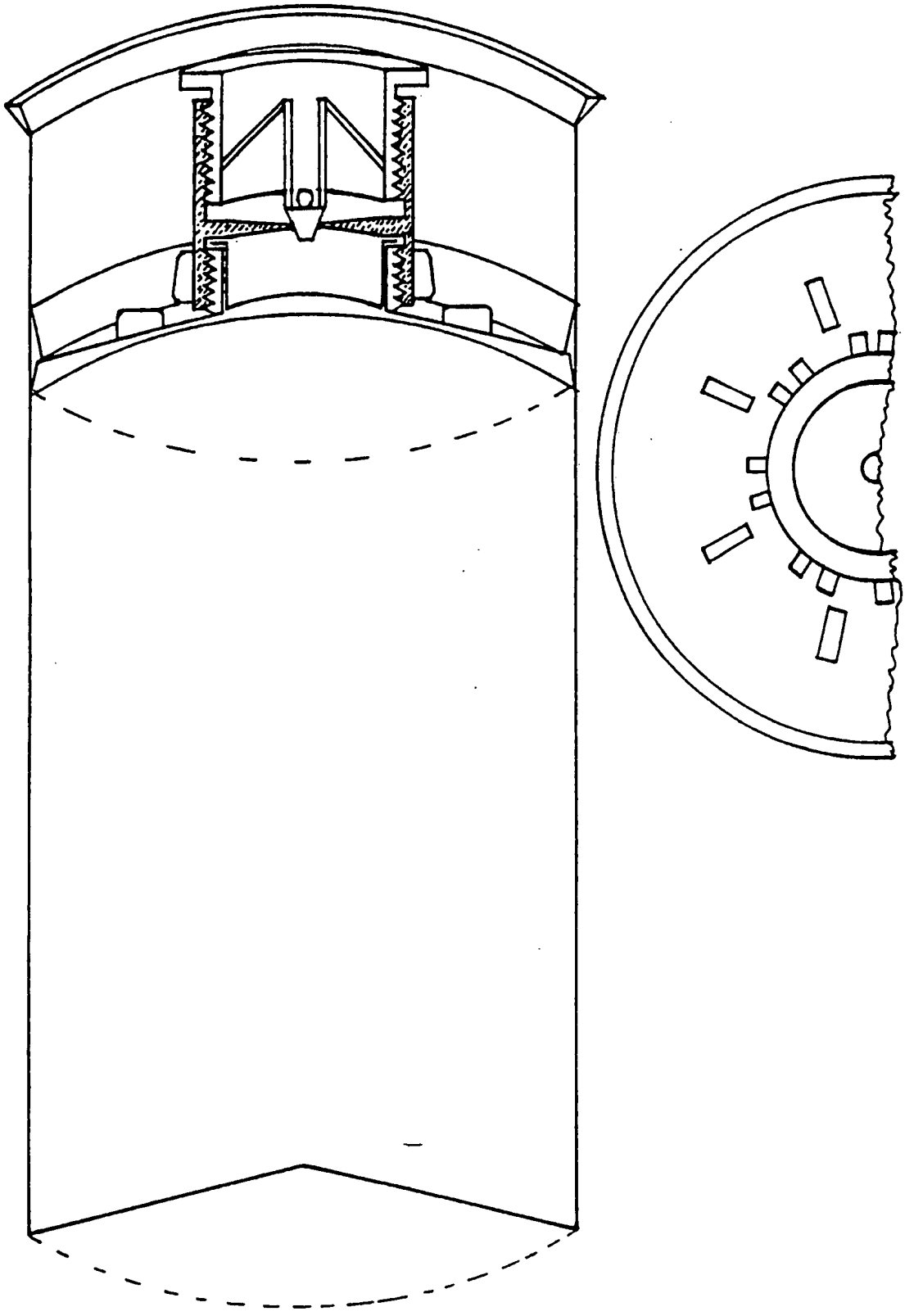

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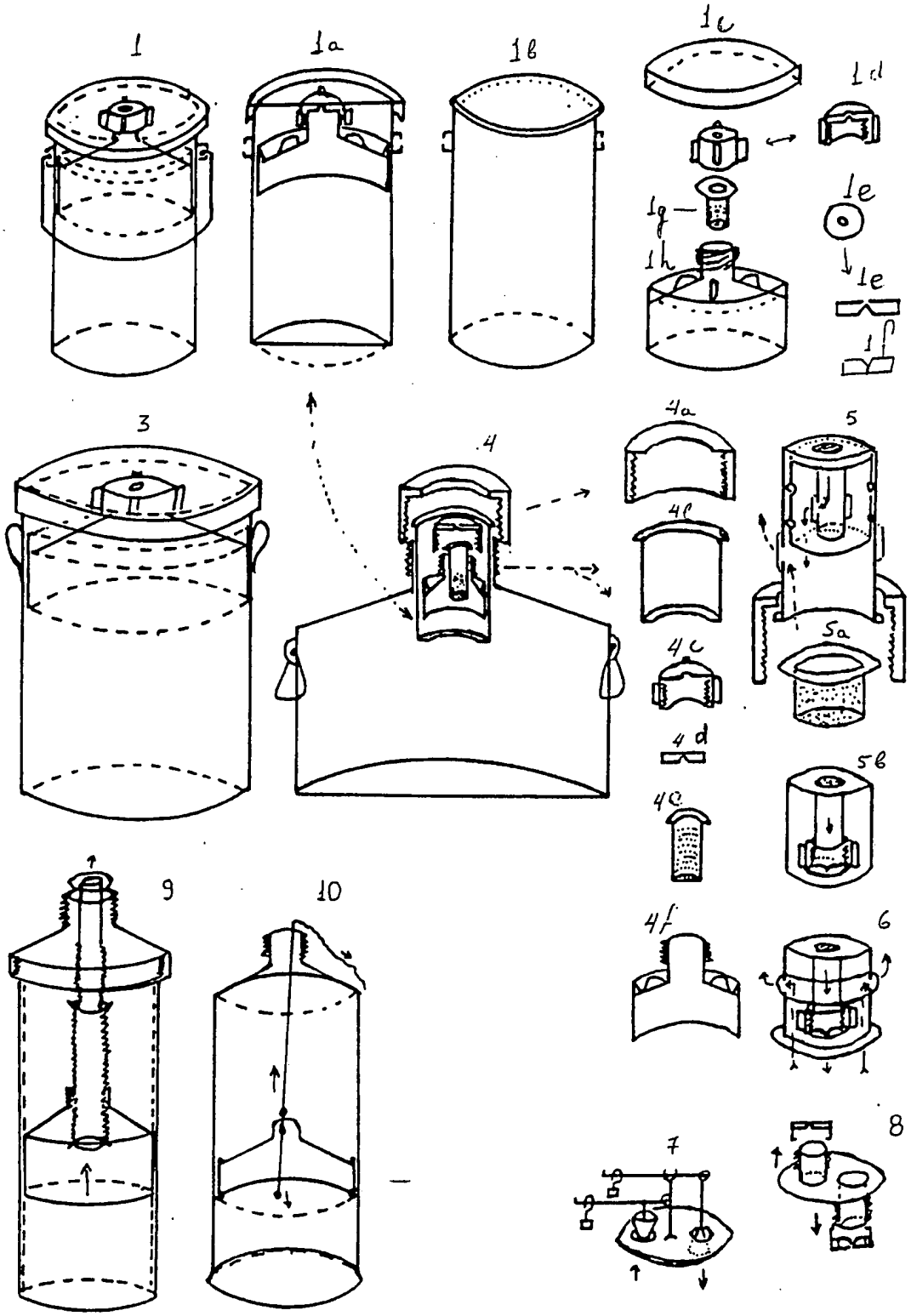

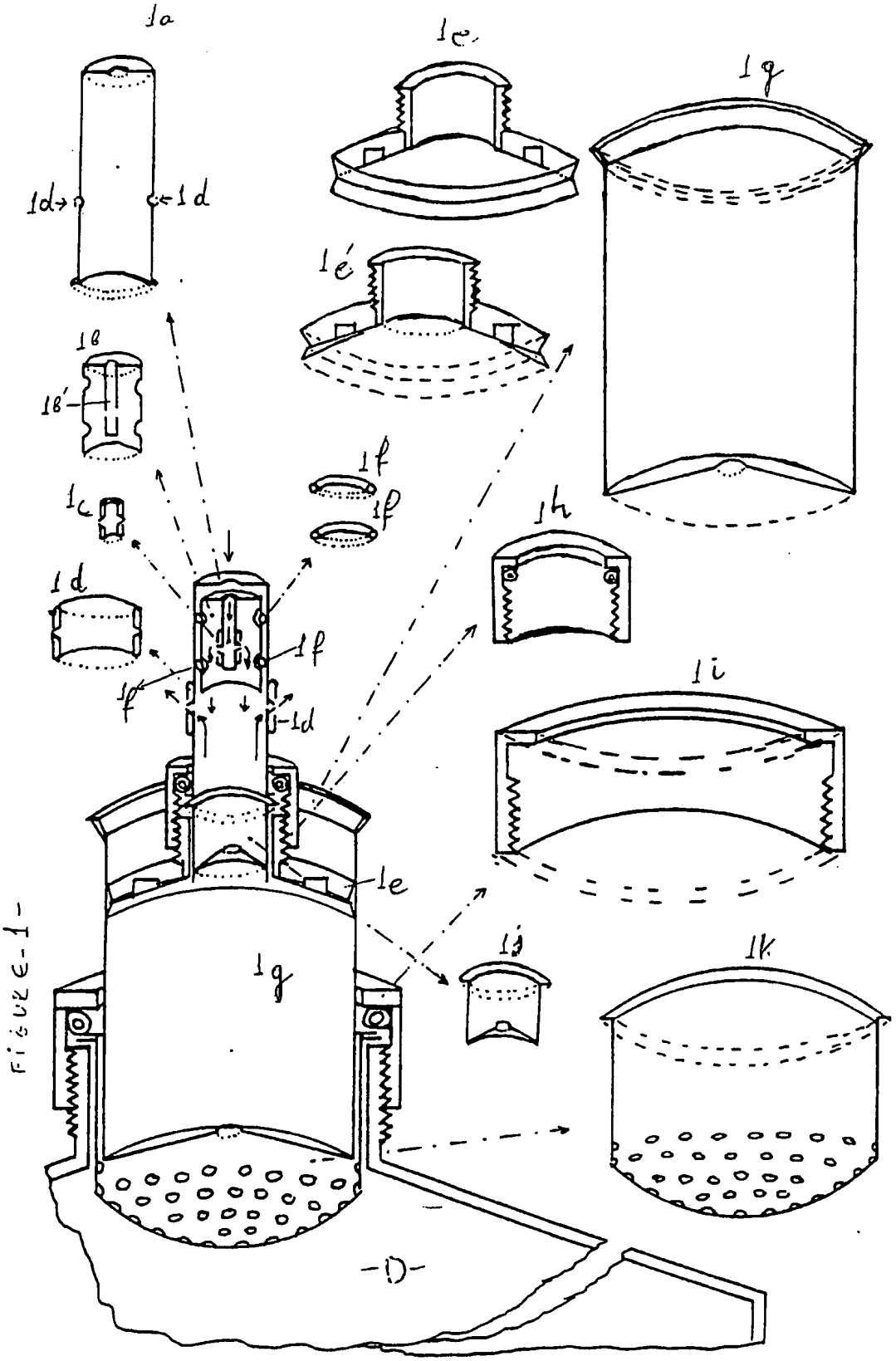

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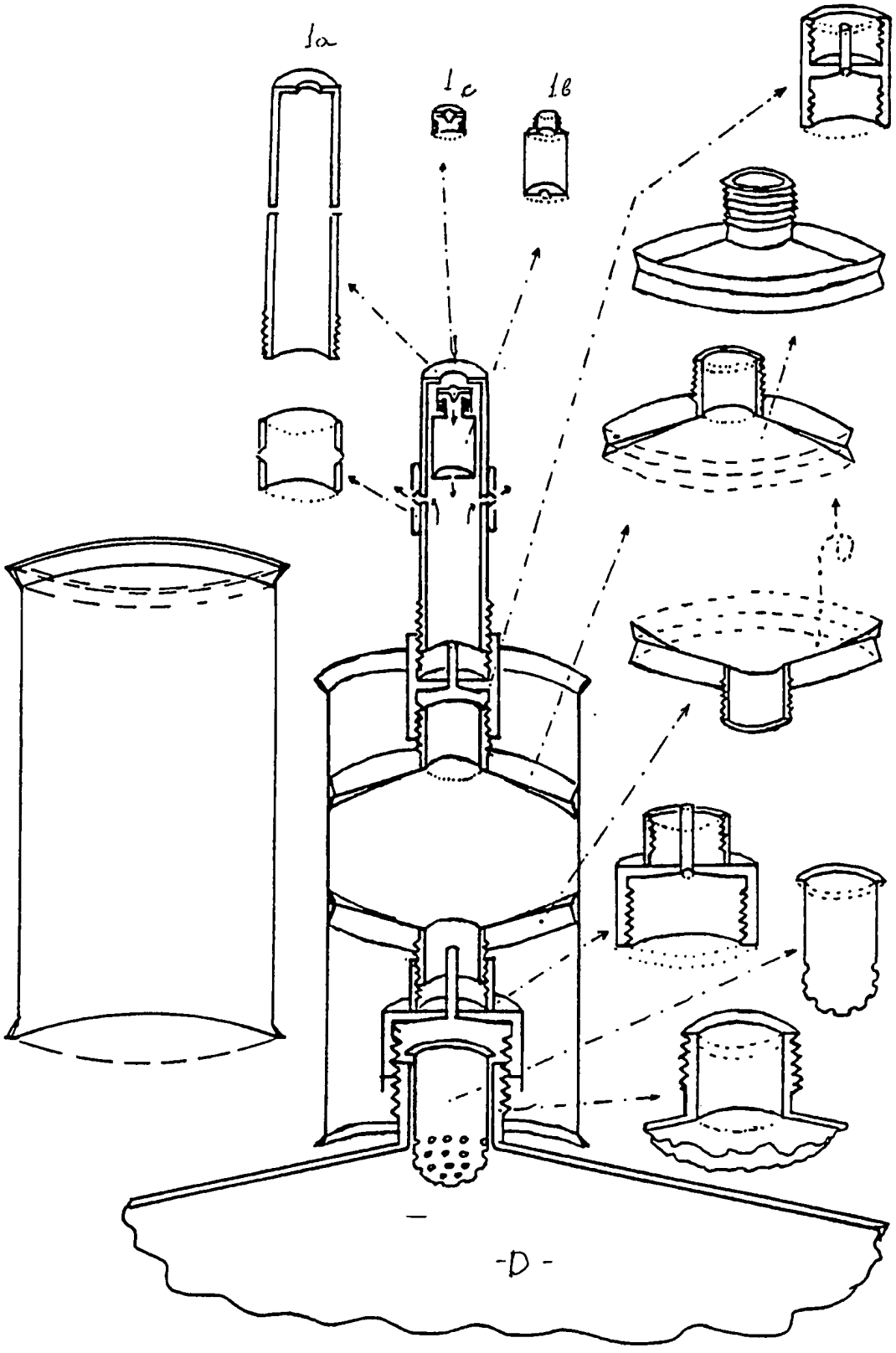

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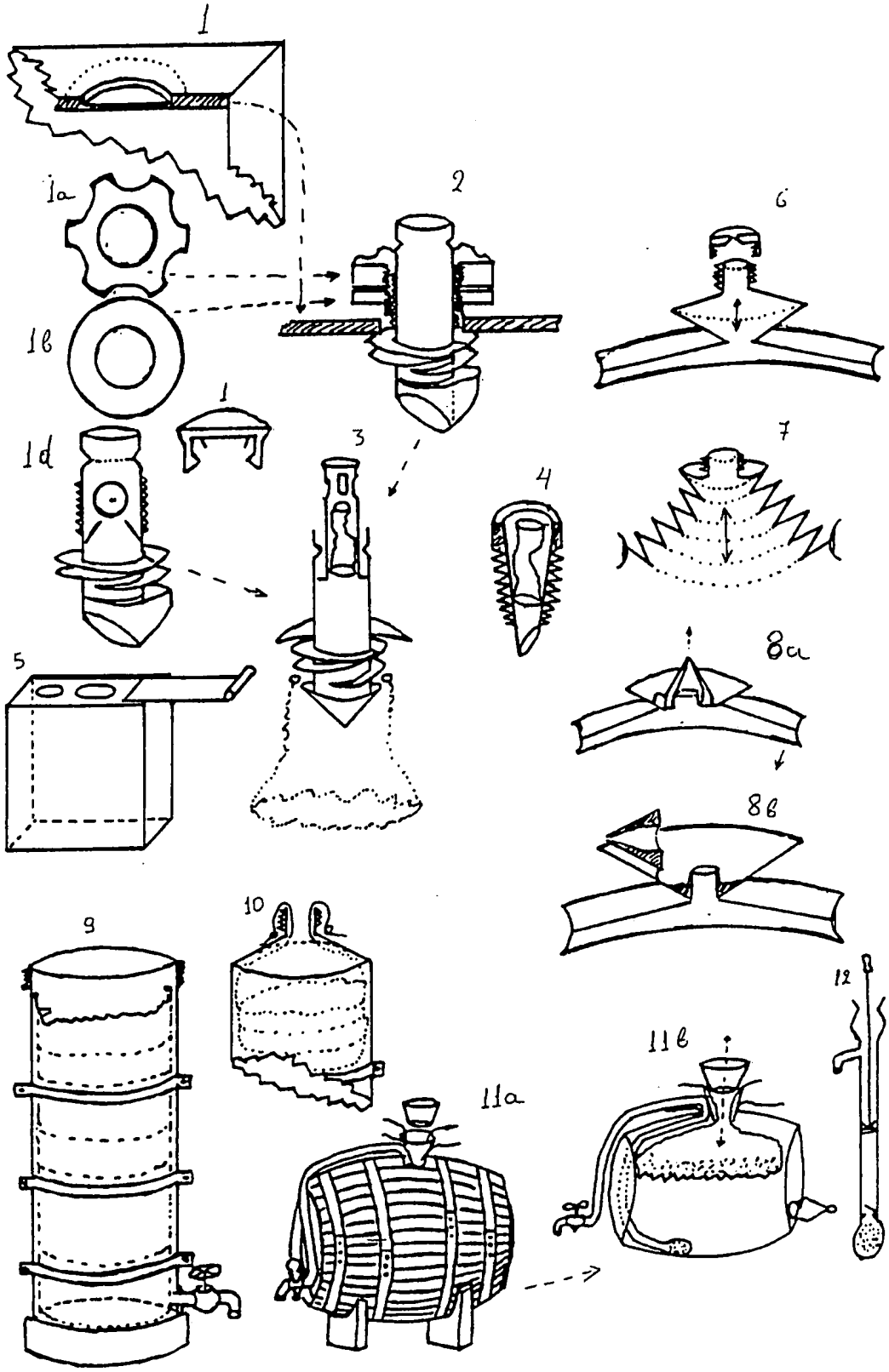

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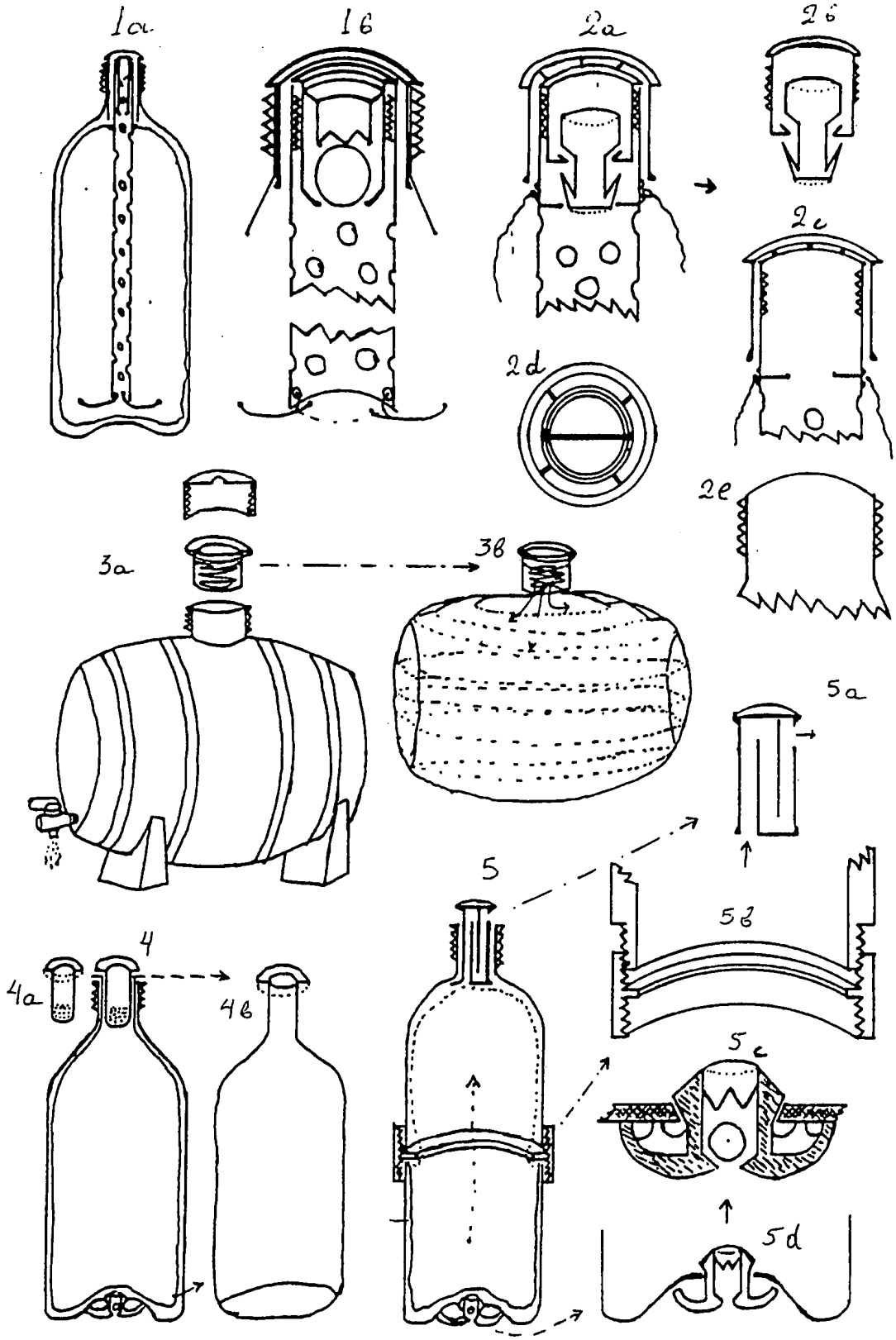

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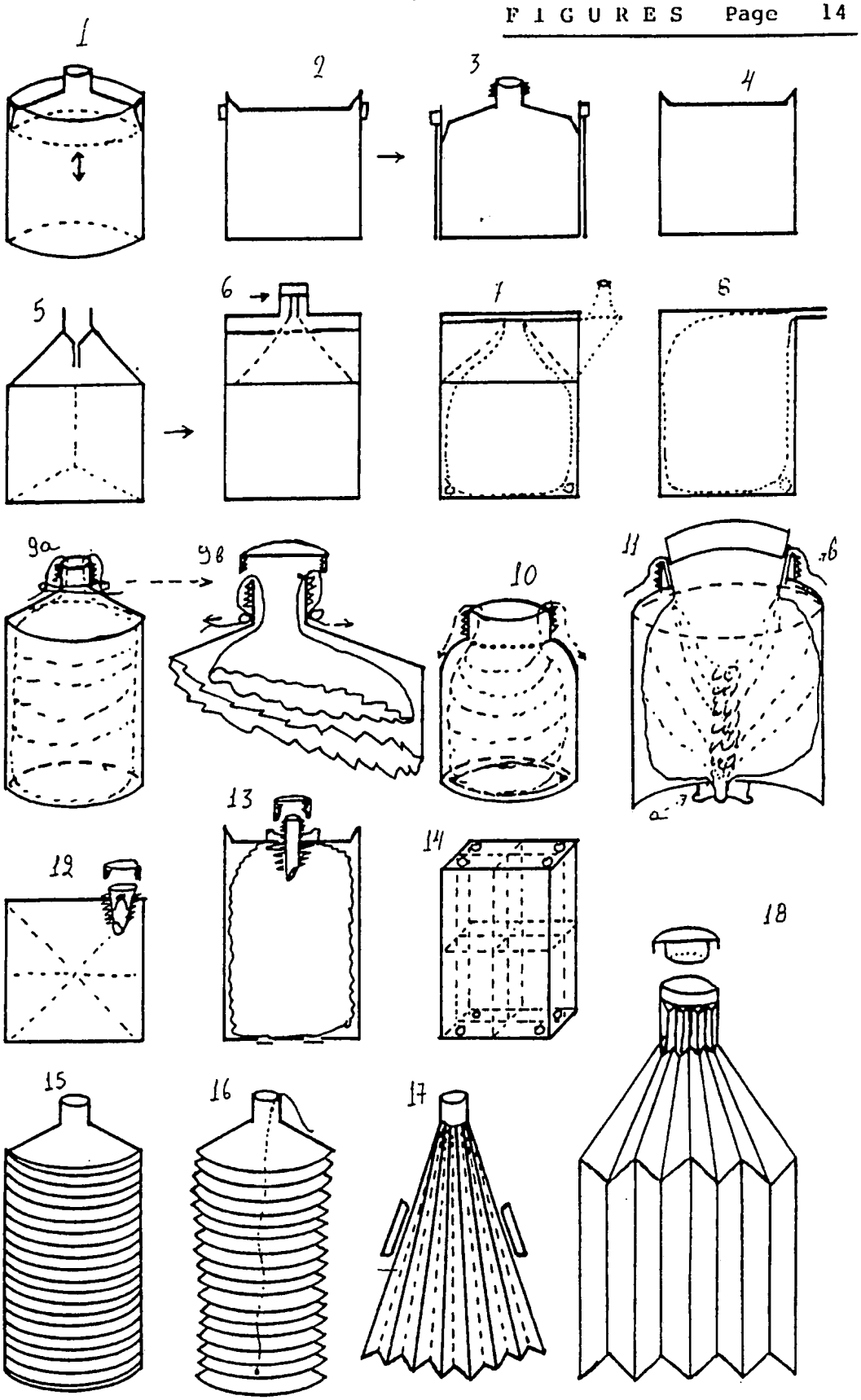

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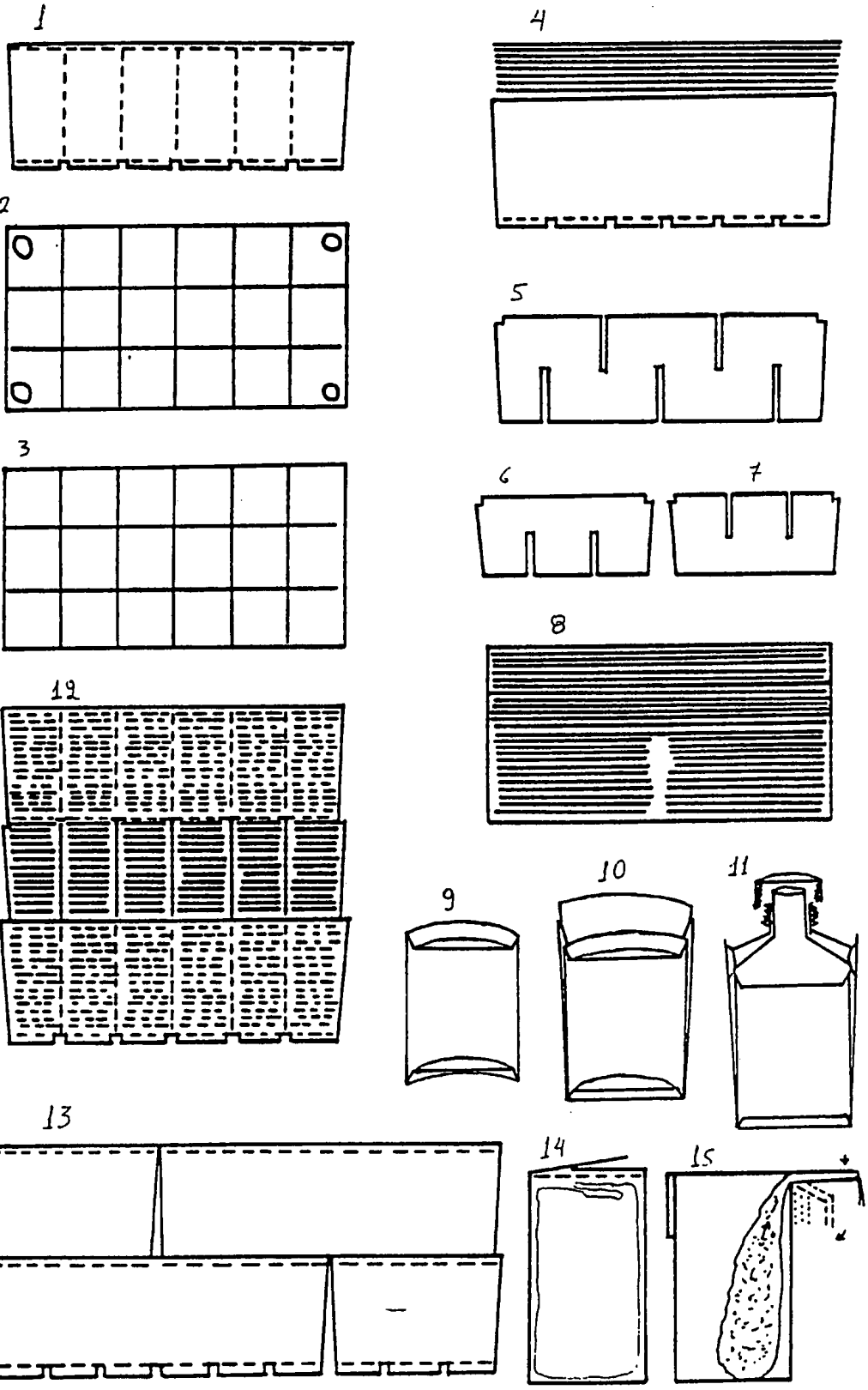

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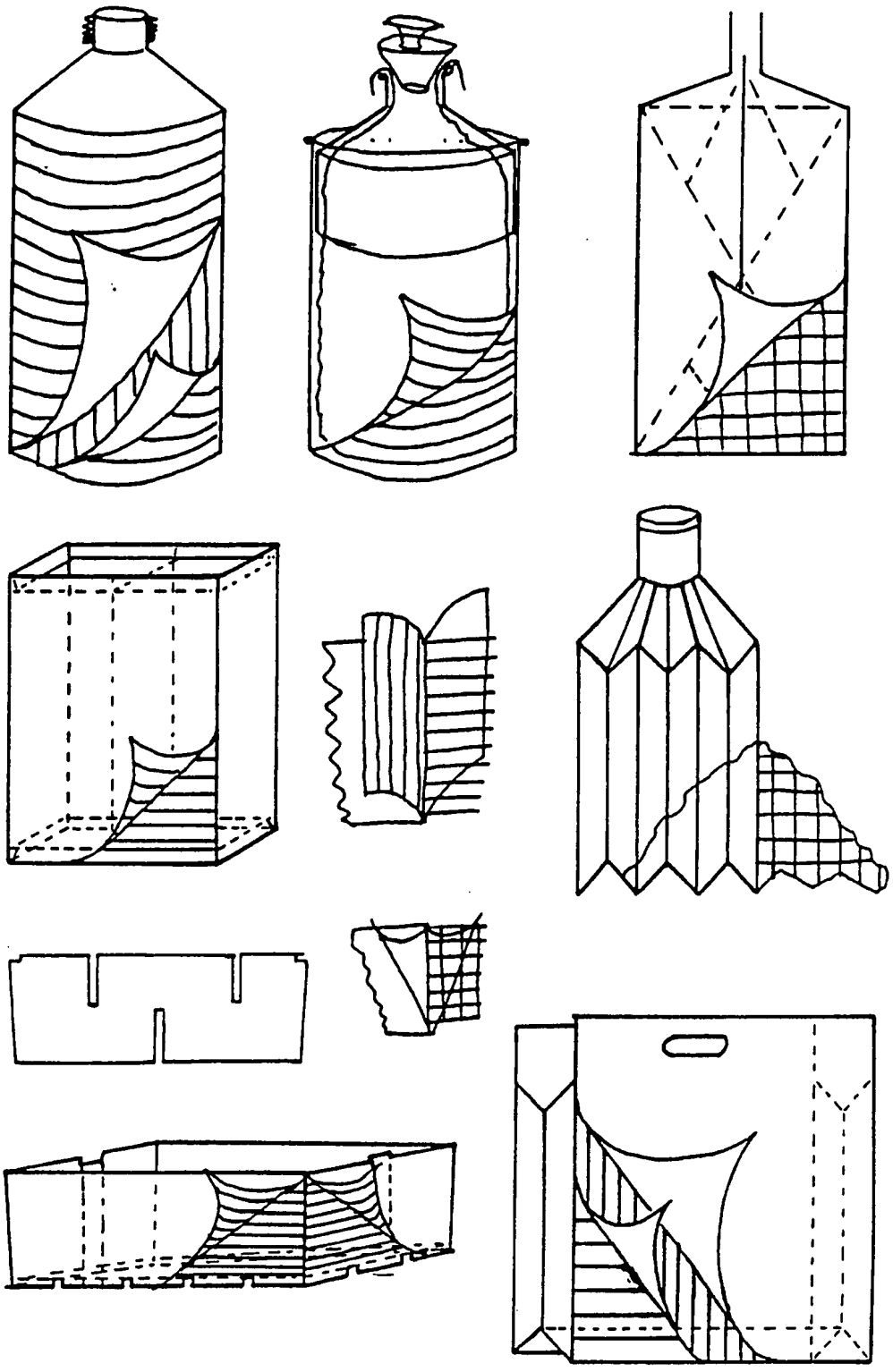

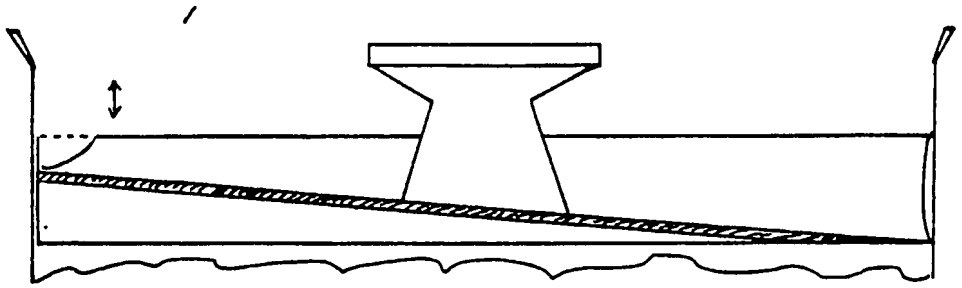
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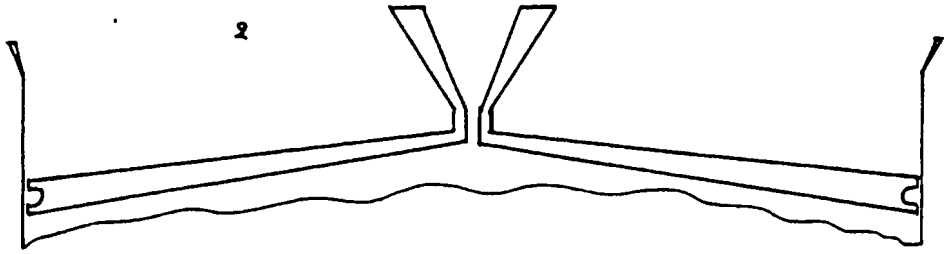
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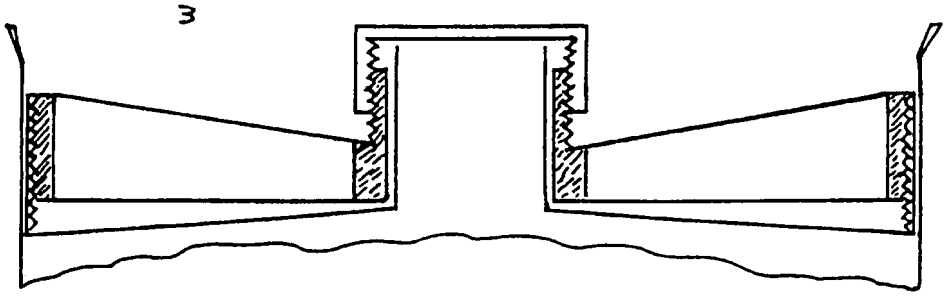
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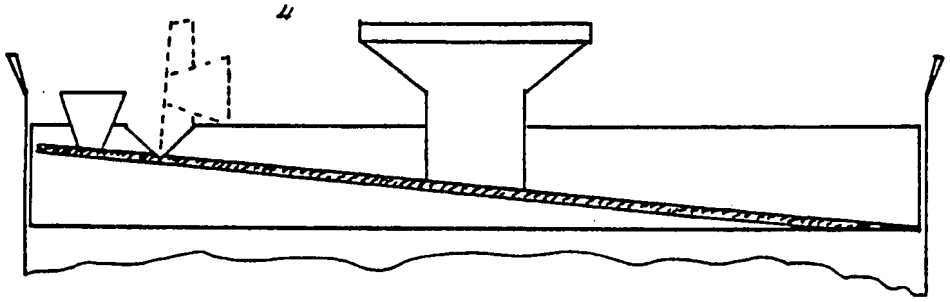
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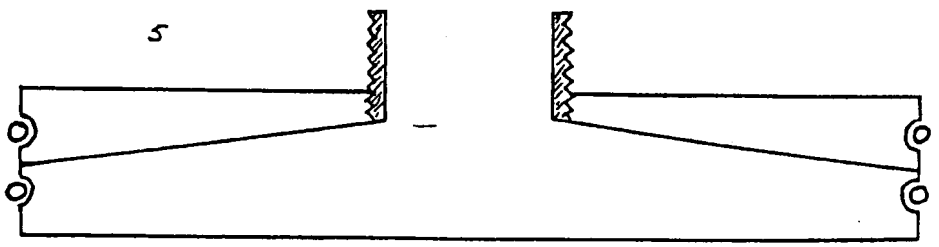
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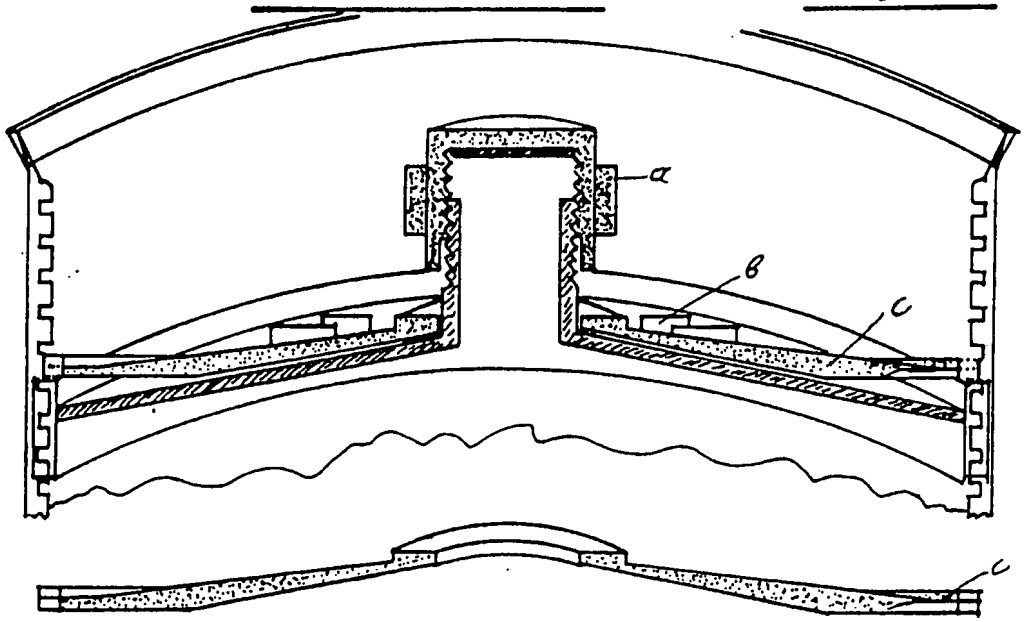
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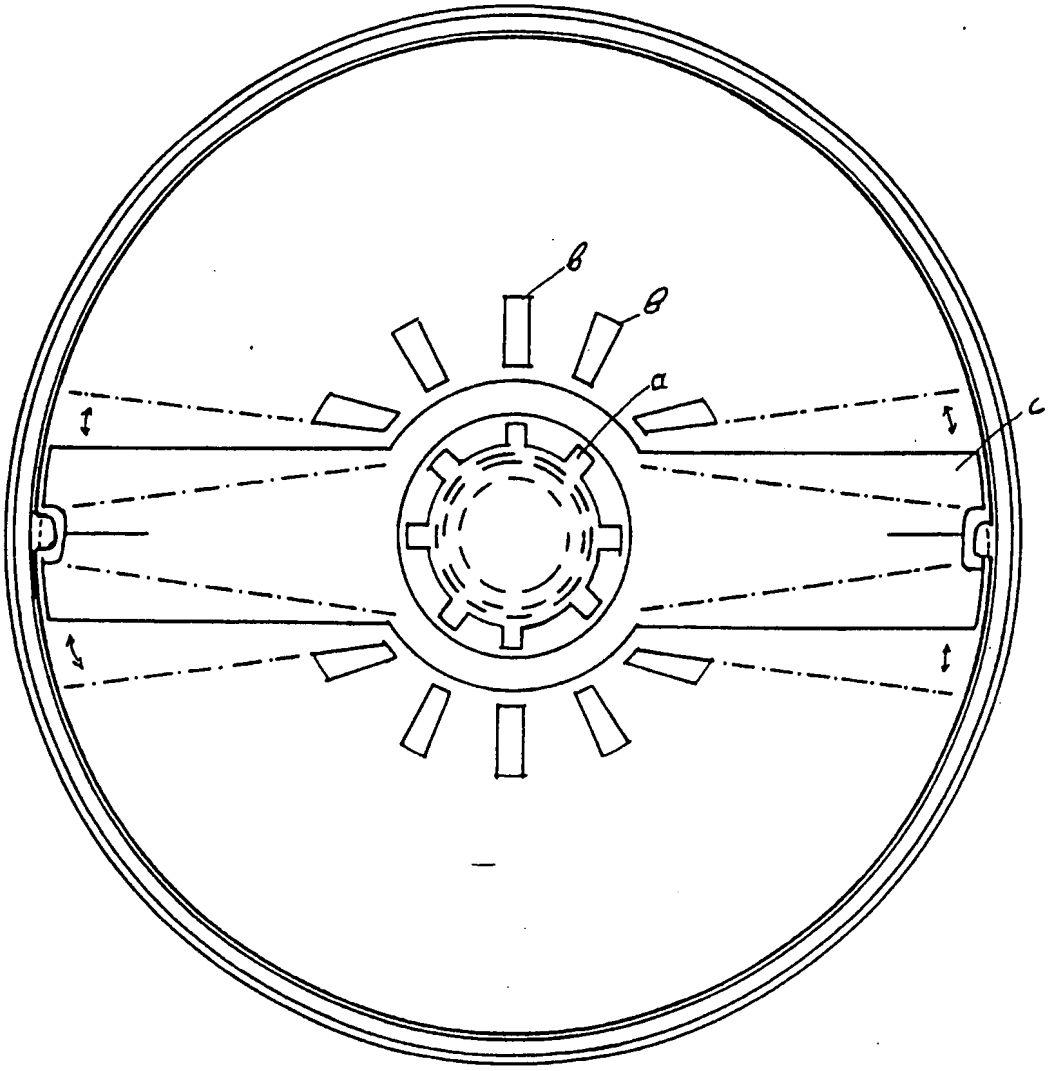
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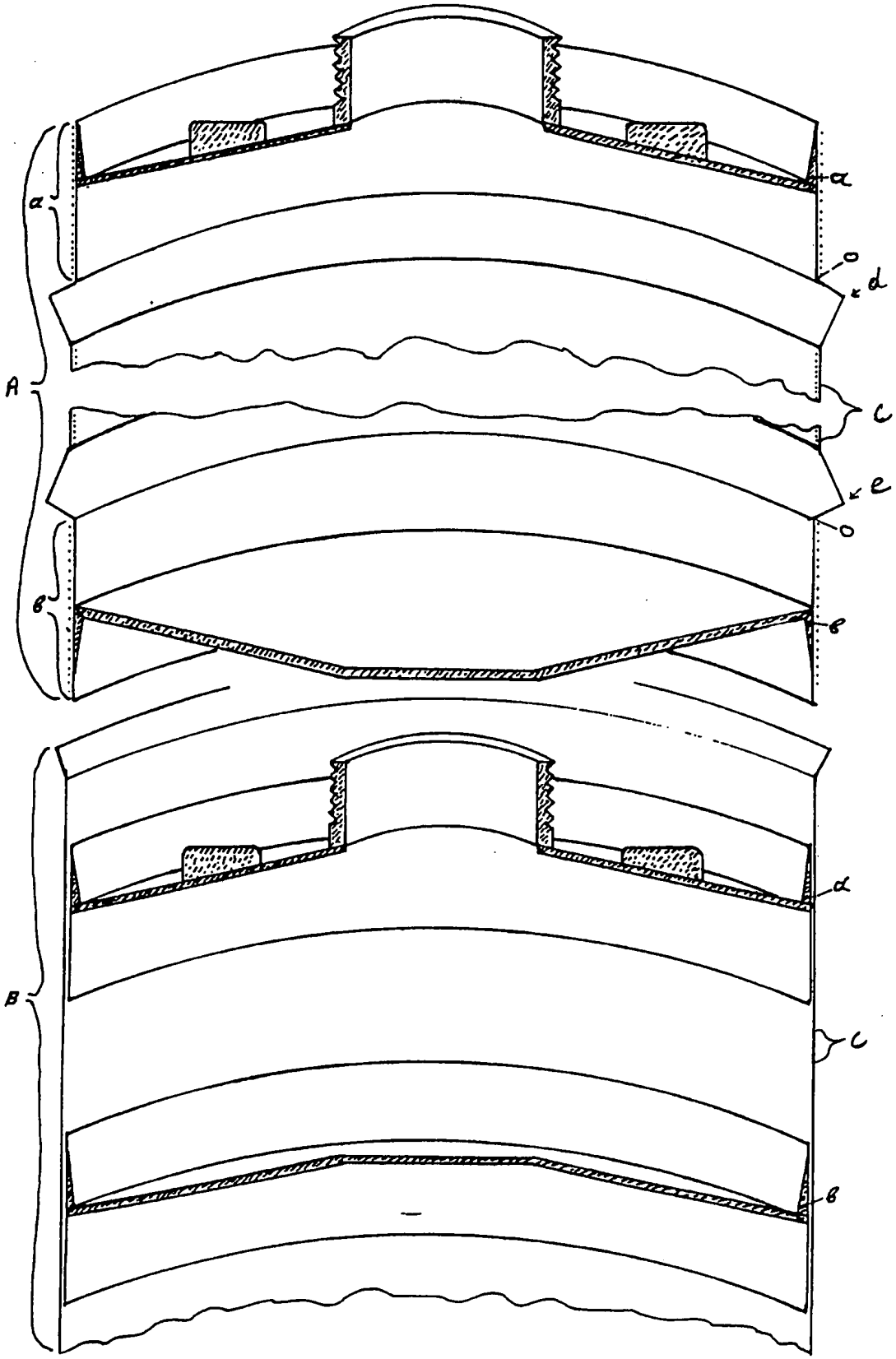
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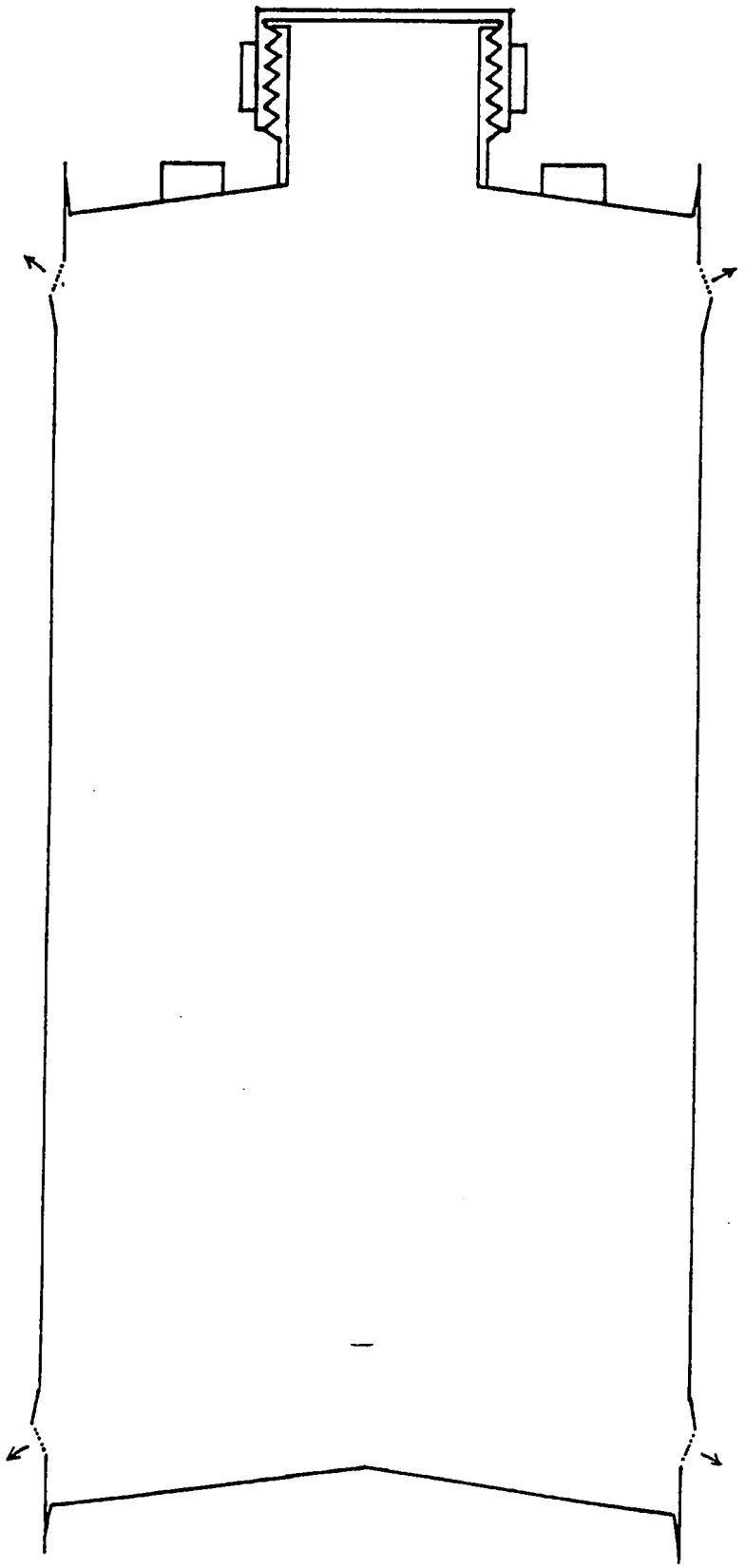

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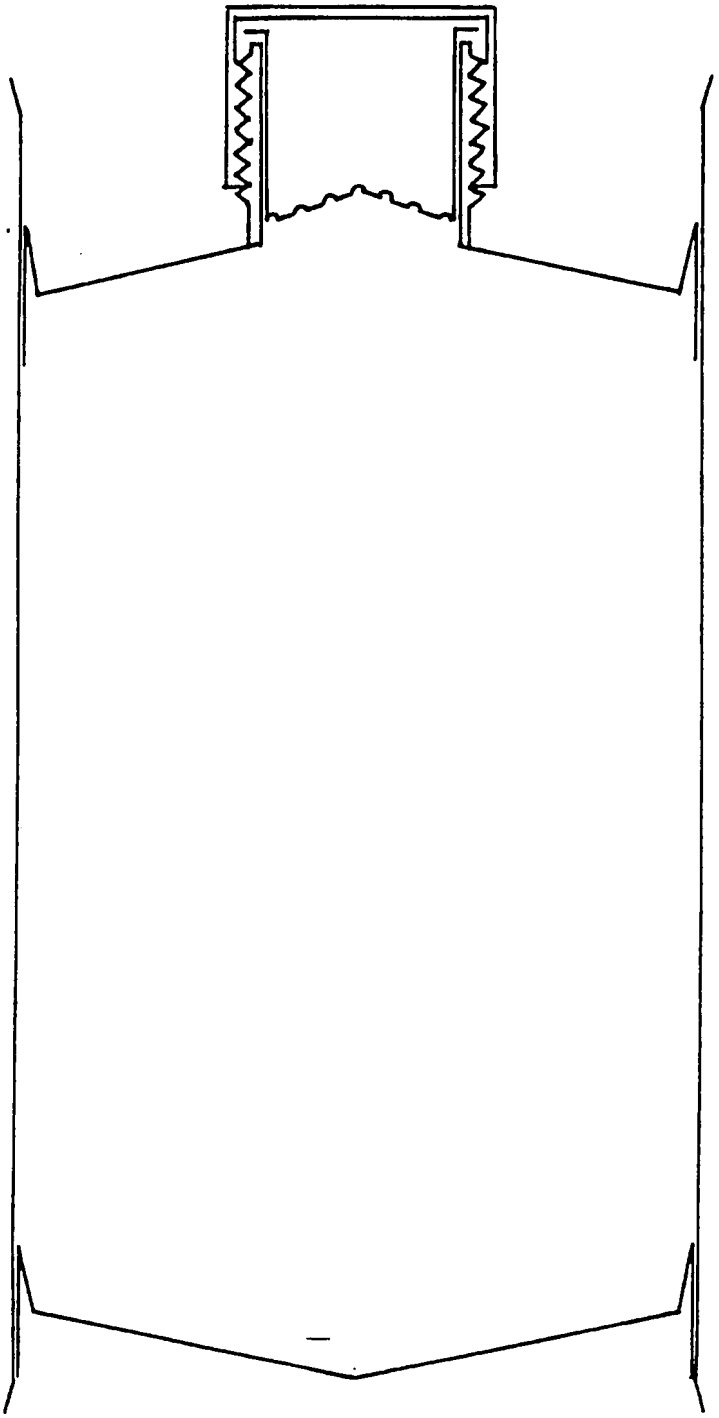

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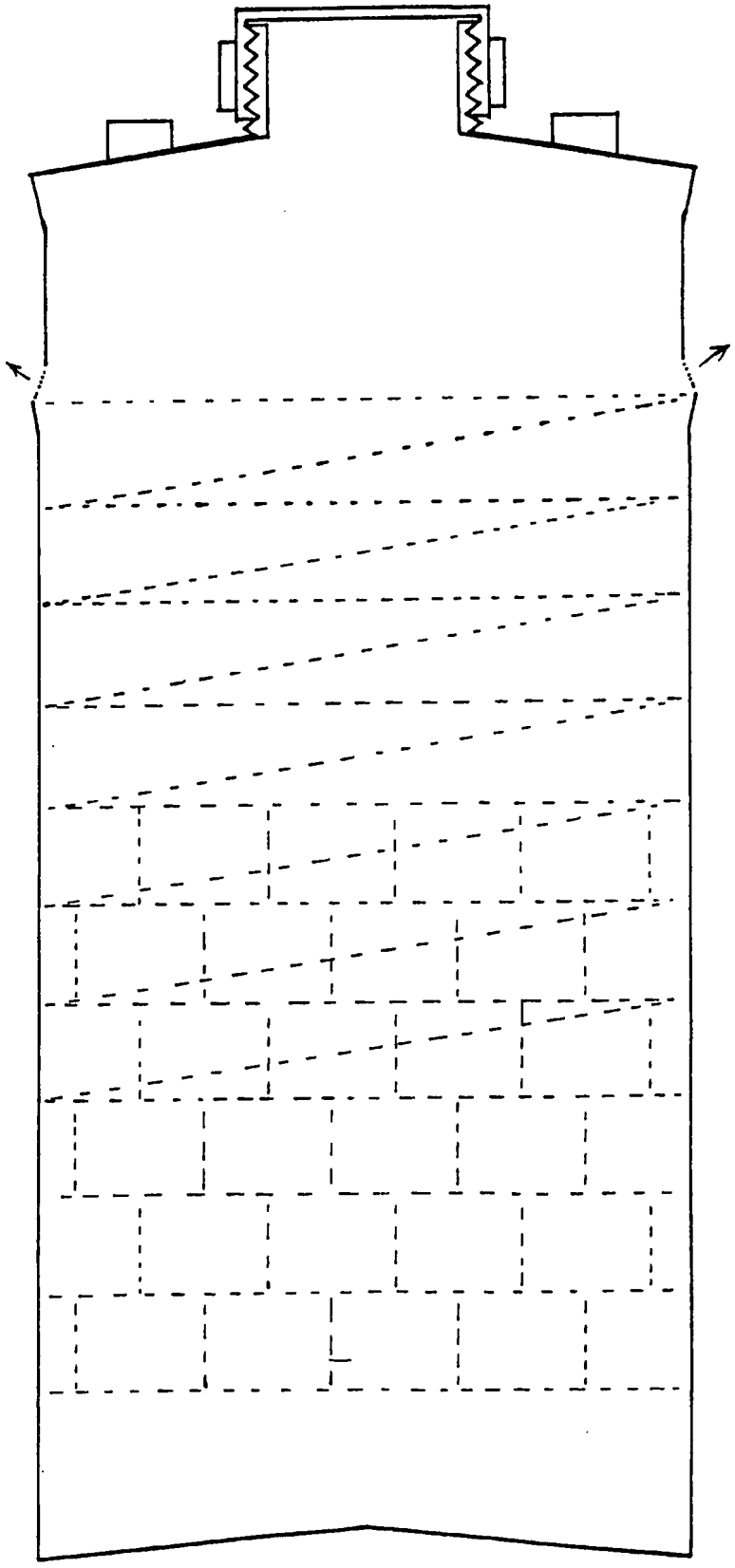

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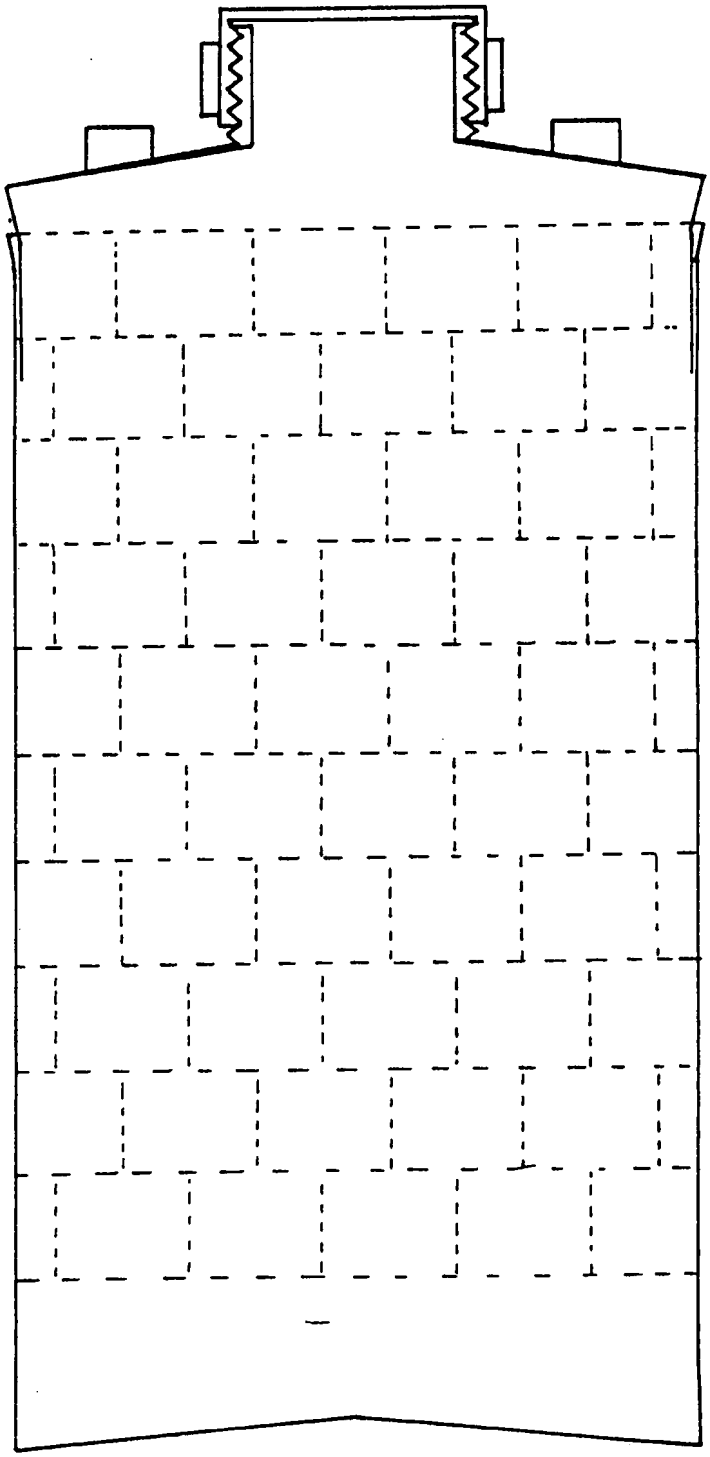

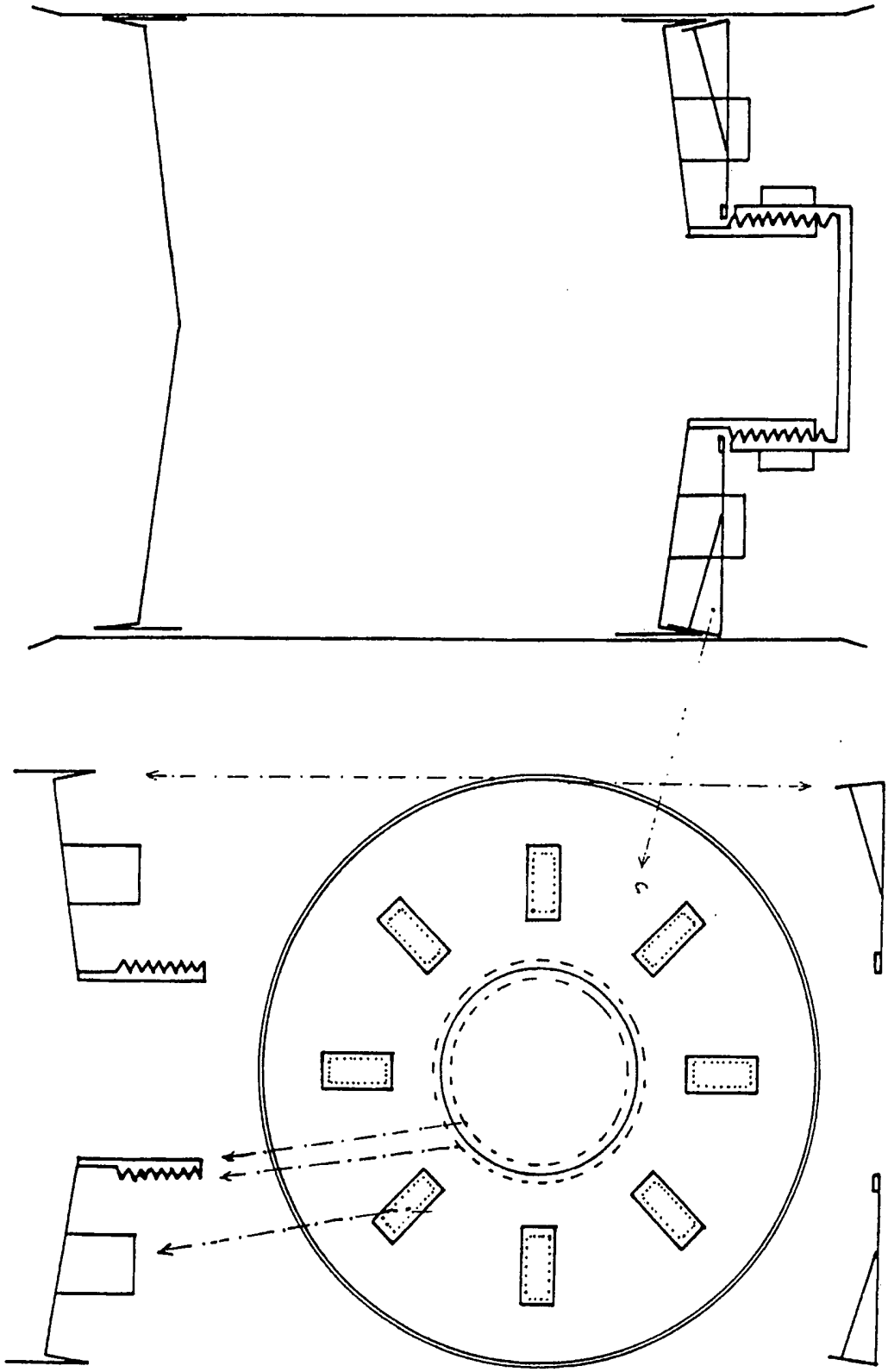

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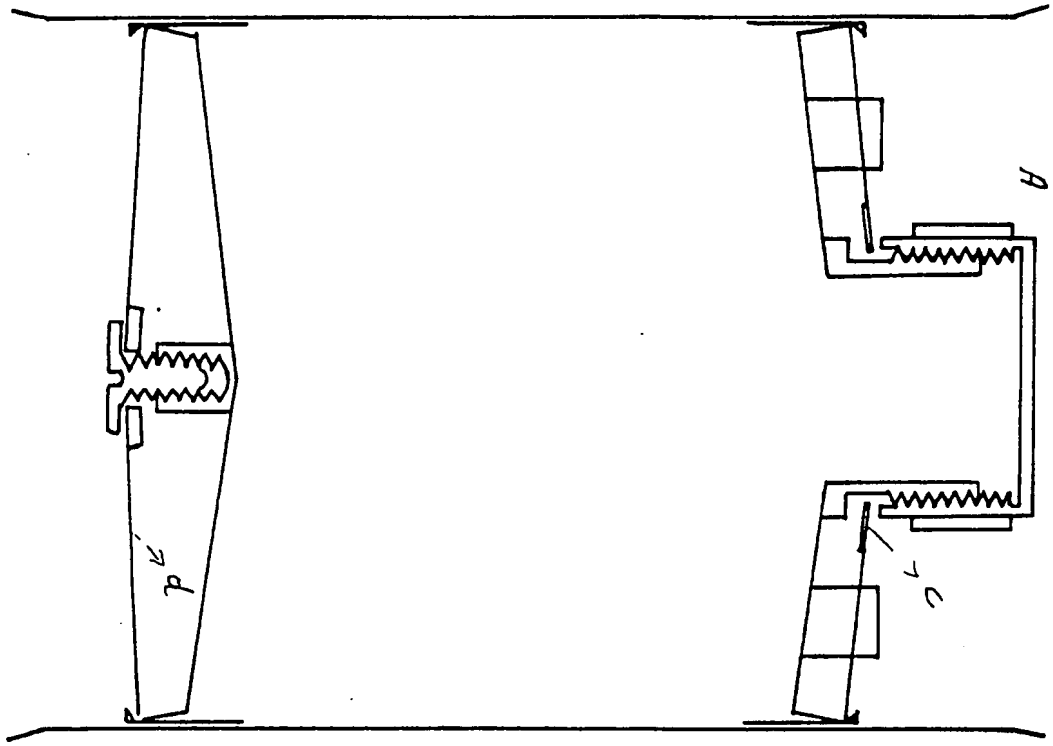
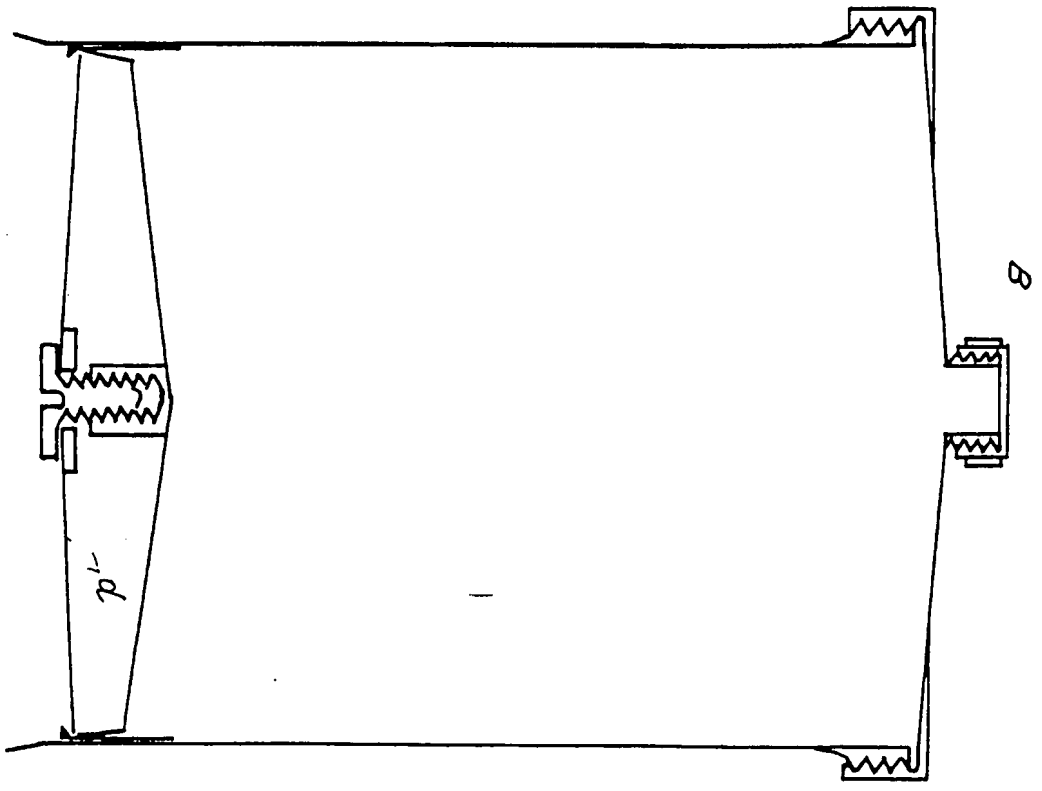
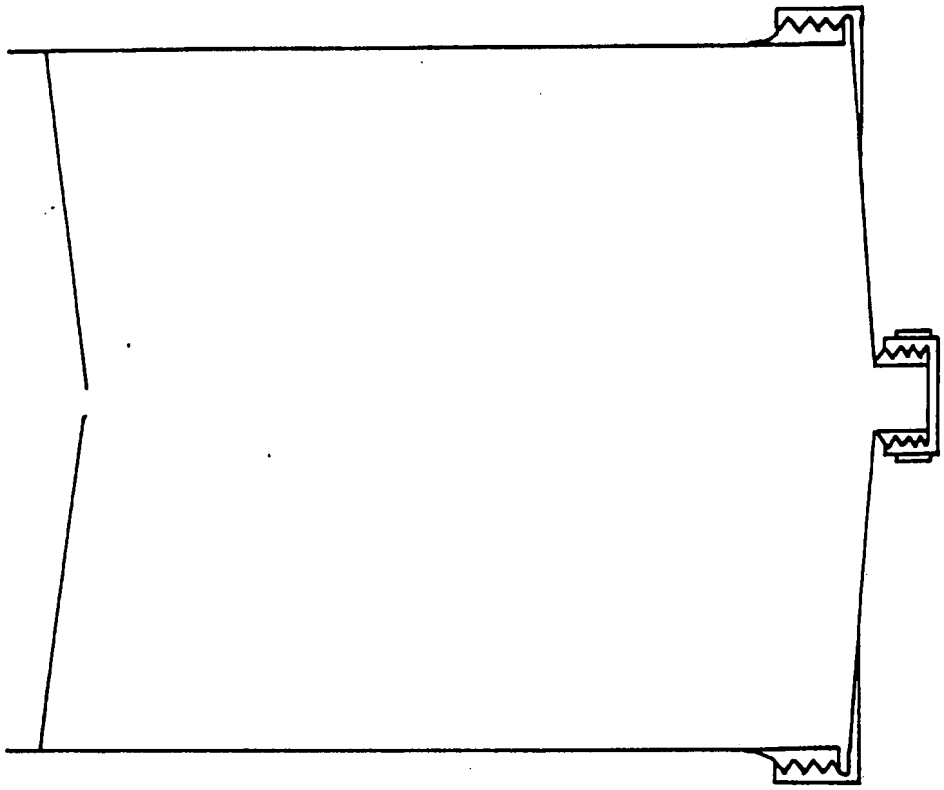
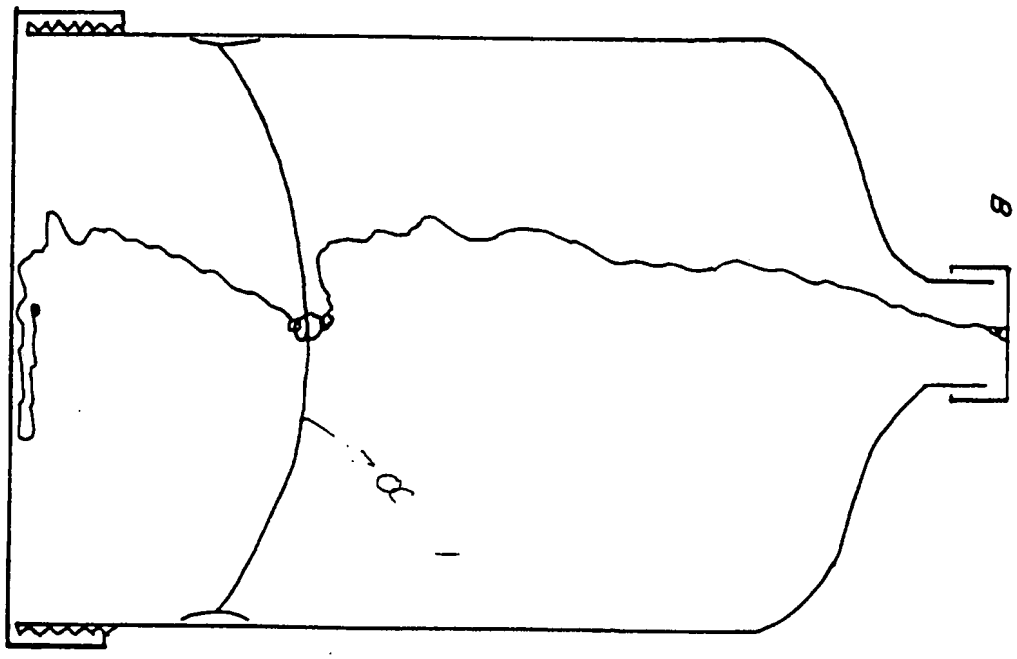
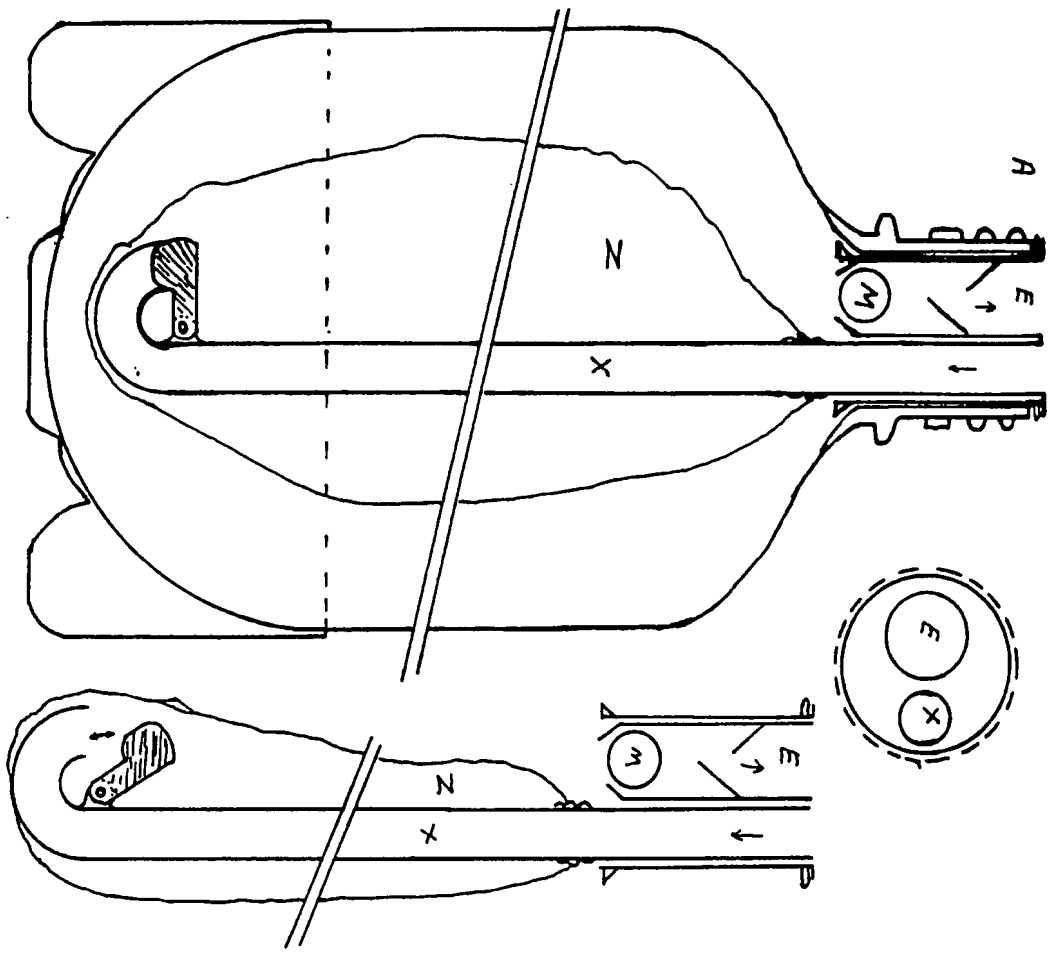




FIGURES



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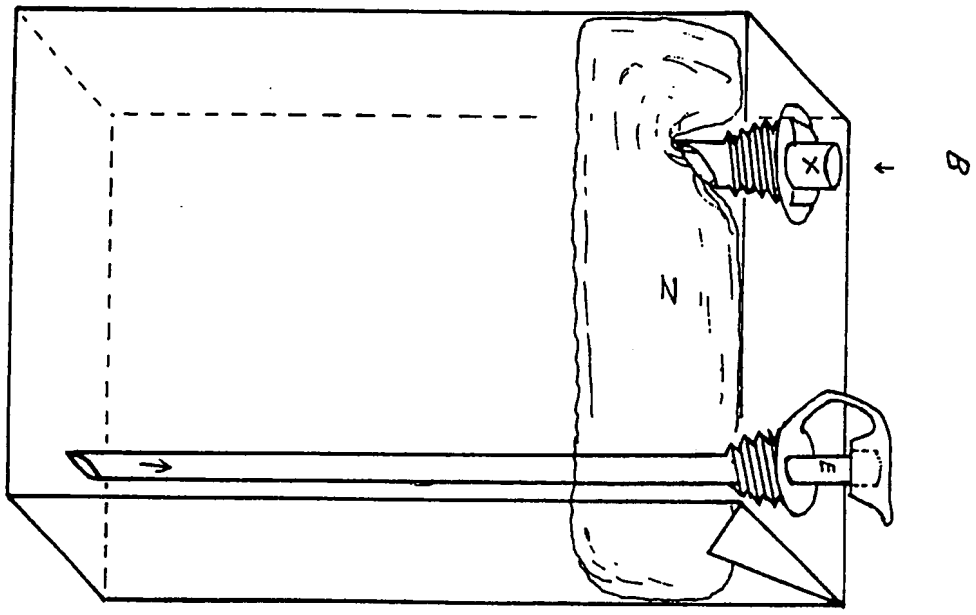
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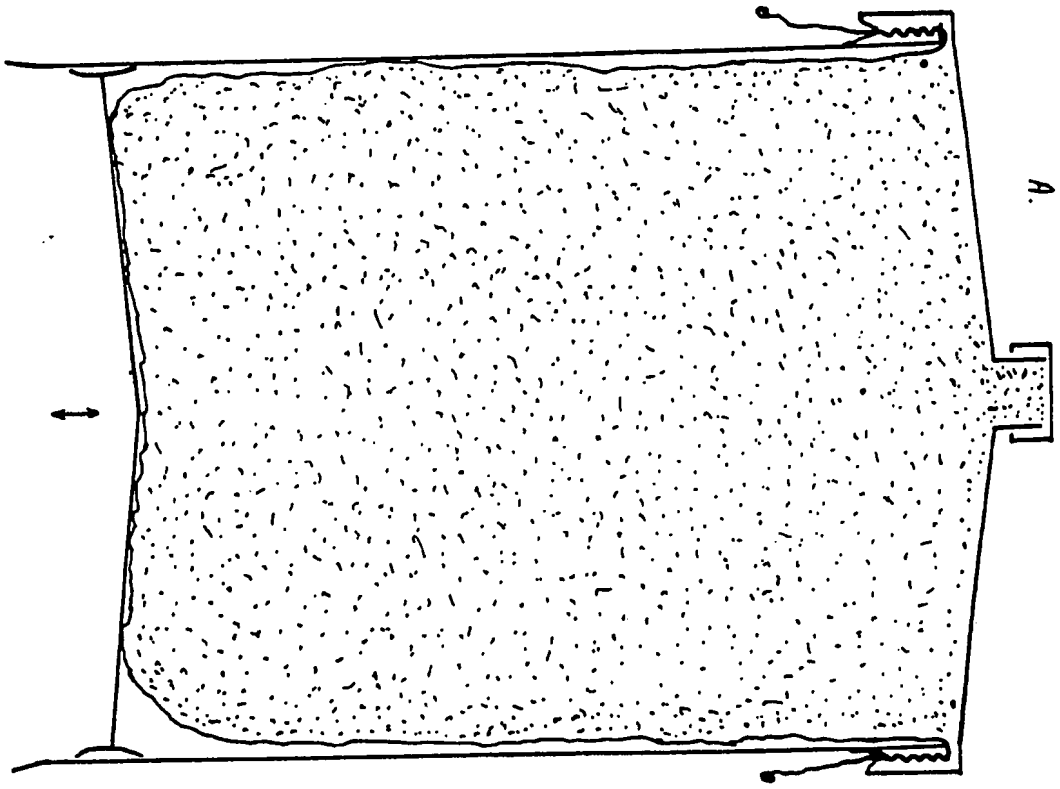

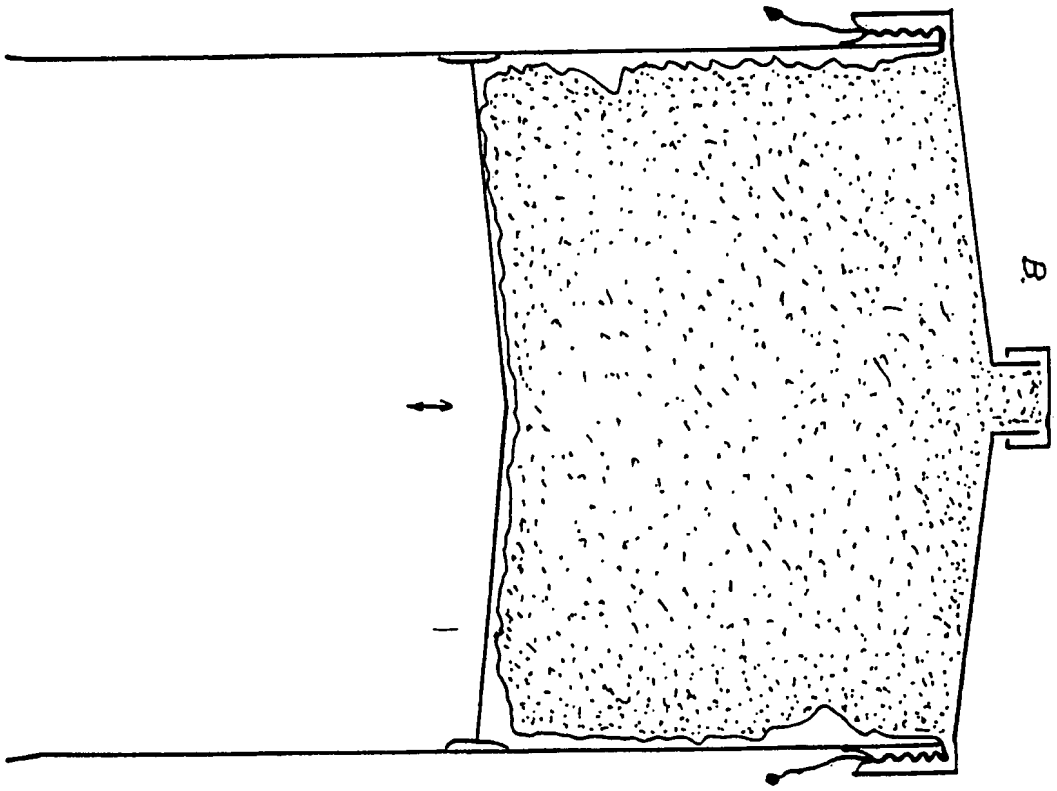

INTERNATIONAL SEARCH REPORT

International Application No PCT/GR 91/00008

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 B65D81/24

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	B65D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
X	FR,A,1 314 002 (BOUET) January 4, 1963 see page 1, left column, line 5 - right column, line 11 see page 2, left column, line 46 - right column, line 36 see page 4, left column, line 3 - line 23 see figures 1,2,10 ---	1,2,3,6, 8
X	DE,A,1 786 272 (THIELE) January 20, 1972 see the whole document ---	1,2,3,5, 6,8
X	DE,A,3 714 401 (SCHWEEN) November 10, 1988 see the whole document ---	1,2,3,6, 8
	-/--	

° Special categories of cited documents : [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
27 SEPTEMBER 1991	16. 10. 91
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	MARTENS L.G.R.

Form PCT/ISA/210 (second sheet) (January 1985)

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	WO,A,8 906 626 (TULLMAN) July 27, 1989 see page 8, line 1 - line 17 see page 10, line 3 - page 12, line 6 see page 13, line 3 - line 23 see page 14, line 12 - line 16 see figures 1-4	1,2,3,6, 8
X	CH,A,161 561 (GUICHARD) December 16, 1933 see the whole document	1,2,5,8
X	US,A,2 147 771 (HATHAWAY) February 21, 1939 see the whole document	1,2,5,8
X	DE,C,847 678 (CLAUS) June 26, 1952 see the whole document	1,2,5,8

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GR 9100008
SA 48270

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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27/09/91

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-1314002		None	
DE-A-1786272	20-01-72	None	
DE-A-3714401	10-11-88	None	
WO-A-8906626	27-07-89	AU-A- 3050489	11-08-89
CH-A-161561		None	
US-A-2147771		None	
DE-C-847678		None	

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